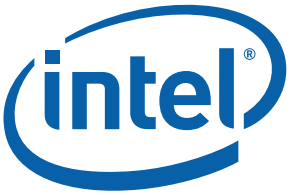

Intel® Debugger

Command Reference

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Conventions and Symbols 1

Table 1-1 Conventions and Symbols Used in this Document

Convention	Explanation	Example
Italic	Italic is used for emphasis, the introduction of new terms, denotation of terms, placeholders, titles of manuals.	*Do not* close the project without saving. The filename consists of the *basename* and the *extension*. The expression *and/or* denotes an inclusive choice between two or more items. The bitmap is *width* pixels wide and *len* pixels high. For more information, refer to the *Intel® Linker Manual*.
Bold	Text in boldface denotes elements of the graphical user interface.	The **Cancel** button of the **Start** dialog box

`Monospace`	Monospace indicates filenames, directory names and pathnames, commands and command-line options, function names, methods, classes, data structures in body text, source code.	`ippsapi.h`
		`\alt\include`
		`ecl -O2`
		
		Use the `CreateObj()` function to …
		`printf("hello, world\n");`

`Monospace italic`	Italic monospace indicates source code parameters, arguments, or other placeholders.	`ippiMalloc( int` *`width`*`, int*` *`pStep`*`);`

Table 1-1 Conventions and Symbols Used in this Document

Convention	Explanation	Example
Monospace bold	Bold monospace indicates what you type as input on a command line	`[c:] dir`
	or emphasizes parts of source code.	`x = ( h > 0 ? sizeof(m) : 0xF ) + min;`
[ ]	Items enclosed in brackets are optional.	Fa[c] Indicates Fa or Fac.
{ | }	Braces and vertical bars indicate the choice of one item from a selection of two or more items.	X{A | B | C} Indicates one of XA, XB, and XC.
"[" "]" "{" "}" "|"	Writing a metacharacter in quotation marks negates the syntactical meaning stated above; the character is taken as a literal.	"[" X "]" [Y] denotes the letter X enclosed in brackets, optionally followed by the letter Y.
…	The ellipsis indicates that the previous item can be repeated several times.	*filename* … Indicates that one or more filenames can be specified.
,…	The ellipsis preceded by a comma indicates that the previous item can be repeated several times, separated by commas.	*word* ,… Indicates that one or more words can be specified. If more than one word is specified, the words are comma-separated.
>	Indicates a menu item inside a menu.	**File > Close** indicates to select the **Close** item from the **File** menu.

Before You Begin 2

Configuring the Debugger

Configuring Default Startup Actions Using Initialization Files

You can use an initialization file to execute specific commands when the debugger starts up. For example, you can create an initialization file to load a debuggee as soon as the debugger starts.

You can have an initialization file in your home directory as well as in your project directory. You can connect to the target in the initialization file in your home directory, and use the project initialization file to open a specific executable file and set a breakpoint.

When you start the debugger, it reads `.gdbinit`. The debugger first looks for the initialization file in your home directory, and then in the current directory.

Example

The following `.gdbinit` file is stored in the project directory. It does the following:

1. Opens the executable `app_name`:

   ```
   idb file app_name
   ```

2. Sets a breakpoint at `main`:

   ```
   break main
   ```

3. Runs `app_name`:

   ```
   run
   ```

Here is the full sample `.gdbinit` file:

```
file app_name
break main
run
```

How the Debugger Finds Source Files

The debugger searches for a source file (*dir_name*/*base_name*) using the following algorithm:

1. If *dir_name* is mapped to another source directory (*mapped_dir_name*), look for *mapped_dir_name*/*base_name*.
2. If Step 1 fails to find a readable file:
   a. Case 1: If *dir_name* is absolute, look for *dir_name*/*base_name*.
   b. Case 2: If *dir_name* is relative, for each entry *use_dir* in *use_list*, look for *use_dir*/*dir_name*/*base_name*. The debugger attempts to use the directories in *use_list* in the order in which they appear.
3. If Step 2 fails, for each entry *use_dir* in *use_list*, look for *use_dir*/*base_name*. The debugger attempts to use the directories in *use_list* in the order in which they appear.
4. If Step 3 fails, the debugger cannot find any source file.

The debugger uses the first-found readable file as the source file.

See Also

Specifying Source Directories

Specifying Source Directories

You can change the source path information that the symbol file specifies. The debugger assumes that all source files are stored in the same directory as they were at compile time.

See Also

directory (gdb mode only)
use (idb mode only)

Specifying Source Path Substitution Rules

The debugger assumes that all source files are stored in the same directory as they were at compile time. If the sources are placed in different directories, you can add a source path substitution rule. This rule will replace the source directory paths automatically.

See Also

Specifying Source Directories
map source directory (idb mode only)
set substitute-path (gdb mode only)

Preparing a Program for Debugging

Preparing Your Source Code

You do not need to make changes to the source code to debug the program. However, it is recommended to make the following items part of your source code:

- An initial stall point, if you cannot stop the process easily from within the debugger.
- Assertions sprinkled liberally through the sources to help locate errors early.

See Also

Preparing the Compiler and Linker Environment
Debugging Optimized Code

Preparing the Compiler and Linker Environment

Debugging information is put into `.o` files by compilers. The level and format of information is controlled by compiler options.

With the Intel® C++ or Fortran Compiler, use the `-g` option. For example:

```
% icc -g hello.c
…
% icpc -g hello.cpp
…
```

With the GNU* Compiler Collection, (GCC) use the `-g` option. On some older versions of GCC, this option might generate DWARF-1. If so, use the `-gdwarf-2` option. For example:

```
% gcc -gdwarf-2 hello.c
…
% g++ -gdwarf-2 hello.cpp
…
```

See your compiler's documentation for more details.

The debugging information is propagated into the `a.out` (executable) or `.so` (shared library) by the `ld` command.

If you are debugging optimized code, using `-g` automatically adds `-O0`.

See the Debugging Optimized Code section of this manual and the appropriate compiler documentation for information about `-g` and related extended debug options and their relationship to optimization.

See Also

Preparing Your Source Code
Debugging Optimized Code

Debugging Optimized Code

The debugger can help debug an optimized program that is compiled with the `-g` option. However, some of the information about the program may be inaccurate. In particular, the locations and values of variables are often not correctly reported, because the common forms of debug information do not fully represent the complexity of the optimizations provided by the `-O1`, `-O2`, `-O3` and other optimization options.

To avoid this limitation, compile the program with an Intel® compiler, specifying both the `-g` and `-debug` extended options, in addition to the desired `-O1`, `-O2` or `-O3` optimization option. This causes the generation of more advanced, but less commonly supported debug information, which enables the following:

- Giving correct locations and values for variables, even if they are in registers or at different locations at different times. Note the following:
  - Some variables may be optimized away or converted to data of a different type, or their location may not be recorded at all points in the program. In these cases, printing a variable will yield `<no value>`.
  - Otherwise, the values and locations will be correct, though registers have no address, so a `print &i` command may print a warning.
  - Most variables and arguments are undefined during function prologues and epilogues, though a `break main` command will usually stop the program after the prologue.
- Shows inline functions in stack traces, identified by the inline keyword. Note the following:
  - Only the function at the top of the stack and functions that make regular (non-inline) calls show instruction pointers, because other functions share a hardware-defined stack frame with the inline functions that they called.
  - The return instruction will only return control to a function that made a non-inline call using a call instruction, because inline calls have no defined return address.
  - The `up`, `down`, and `call` commands work as usual.
- Allows you to set breakpoints in inlined functions.

The following limitation exists:

Optimization often causes the instructions for a source line to be generated in an order that does not match the order of the source; the instructions for a line may be mixed in with instructions from other source lines as well. When stepping through such code, the program will tend not to stop at each source line in turn, but rather it will stop each time a change in source line occurs.

See Also

Preparing Your Source Code
Preparing the Compiler and Linker Environment

Starting and Exiting the Debugger

3

Starting the Debugger

On systems based on IA-32 or Intel® 64 architecture running Linux* OS, the debugger runs in GUI mode by default. You can also start the debugger in command line mode on these systems by specifying `idbc` instead of `idb` in the command line.

On all other systems, the debugger only runs in command line mode.

NOTE. The `idb` command is enabled when you run the script that sets up the compiler environment as described in the *Getting Started* document for the compiler.

To start the debugger:

Enter the following command in a shell:

```
idb
```

The debugger starts running.

See Also

Exiting the Debugger

Starting the Debugger in Command Line Mode

The following information applies only to systems based on IA-32 or Intel® 64 architecture running Linux* OS.

By default, the debugger starts in GUI mode. You can also run the debugger without the GUI, in command line mode.

NOTE. The `idbc` command is enabled when you run the script that sets up the compiler environment as described in the *Getting Started* document for the compiler.

To start the debugger in command line mode, enter the following in a shell:

```
idbc
```

The debugger starts running.

You can view a list of options for this command by entering the following command in a shell:

```
idbc --help
```

See Also

Exiting the Debugger

Exiting the Debugger

To exit the debugger:

- Select **File > Exit**.
- Enter **`quit`**.

The debugger and all output files are closed.

See Also

`quit`

Session Handling

4

About Session Handling

You can save information about a debugging session and subsequently restore it.

When you save a session, the debugger saves the following information.

- Source directory paths
- Substitute source directory paths
- Shared library substitution paths
- Environment variables that you changed for a debug session
- Debugger variables
- Debuggee arguments
- Breakpoints and watchpoints

In addition to enabling you to manually save a session, the debugger implicitly uses the following elements of the previous session's settings when you open the same debuggee without restarting the debugger:

- code breakpoints
- data breakpoints
- environment variables

This is true whether you open the debuggee with the GUI or the GDB mode `file` command. You can even use a recompiled debuggee, as long as its name and path are the same.

The debugger does not implicitly use these settings when you detach and reattach to the debuggee process, because it doesn’t recognize whether the process is the same debuggee.

See Also

Reloading a Debuggee Without Previous Session Settings
Saving a Session
Restoring a Session
About Session Handling in Command-line Mode

Reloading a Debuggee Without Previous Session Settings

Because the debugger implicitly uses the previous session's breakpoints, watchpoints and environment variables, when you want to reload and restart the debuggee executable without these settings, you must explicitly remove them.

To restart debugging an executable you are already debugging without any of the existing settings:

1. Load the executable.
2. Run the executable.

See Also

About Session Handling

Saving a Session

To save a session:

1. Select **File > Save Session...**. The **Save Session** dialog box appears.
2. In the **Name** field, enter a name for the session file.
3. Click **OK**.

The debugger saves the session information.

Alternatively, you can use the `idb session save` command as follows:

`idb session save` *`session_file`*

See Also

`idb session save (gdb mode only)`

Restoring a Session

To restore a saved session:

1. Select **File > Load Session...**.
   The Load Session dialog box appears.
2. Select the session file you want to restore.

Alternatively, you can use the `idb session save` command as follows:

`idb session restore session_file`

See Also

idb session restore (gdb mode only)

About Session Handling in Command-line Mode

The debugger variable `$sessiondir` is set to the directory in which the debugger saves session files:

- `$HOME/.idb/sessions/` in command line mode.
- `$PWD/workspace/sessions/` in GUI mode, where `$PWD` is the working directory in which the GUI was started.

You cannot change this directory.

To identify this directory, use the following command:

```
print $sessiondir
```

See Also

Saving a Session
Restoring a Session

Giving Commands to the Debugger

5

Supporting Multiple Processes

The debugger supports concurrently debugging multiple processes at the same time, but at any given time, it is only operating on a single process, known as the current process. The debugger variable `$curprocess` contains the id for this process. Naming and switching the debugger between processes is described in Debugging Multiple Processes.

See Also

Debugging Multiple Processes
Chapter 8, "List of Predefined Debugger Variables"

Debugging Multiple Processes

The debugger does not support debugging multiple processes with the GUI. Use the command-line interface instead.

The debugger can find and control more than one process at a time. The debugger can find and control a process for one of the following reasons:

- It created the process.
- It attached to the process.

At any one time, you can examine or execute only one of the processes that the debugger controls. The rest are stalled. You must explicitly switch the debugger to the process you want to work with, stalling the one it was controlling.

To show the processes that the debugger controls:

1. If you are not already in IDB mode, switch to IDB mode using the following command.

   ```
   (idb) $cmdset = "idb"
   ```

2. Enter the `process` or `show process` command.

The debugger displays any processes it controls.

3. If you want to switch to GDB mode, use the following command:

```
(idb) $cmdset = "gdb"
```

To switch the debugger to a specific process:

1. If you are not already in IDB mode, switch to IDB mode using the following command.

```
(idb) $cmdset = "idb"
```

2. Enter the `process` command.

   The process you are switching away from remains stalled until either the debugger exits or until you switch to it and continue it.

3. If you want to switch to GDB mode, use the following command:

```
(idb) $cmdset = "gdb"
```

NOTE. The `attach` command and the IDB mode command `load` switch the debugger to the process on which they operate.

See Also

"Starting the Debugger" in Chapter 3
process (idb mode only)
show process set
show process (idb mode only)
attach
load (idb mode only)

Supporting Multiple Call Frames, Threads, and Sources

Processes contain one or more threads of execution. The threads execute functions. Functions are sequences of instructions that are generated by compilers from source lines within source files.

As you enter the debugger commands to manipulate your process, it would be very tedious to have to repeatedly specify which thread, source file, and so on, to which you want the command to be applied. To prevent this, each time the debugger stops the process, it reestablishes a static context and a dynamic context for your commands. The components of the dynamic context are dependent on this run of your program, while the components of the static context are independent of this run.

You can display the components of these contexts as debugger variables or by using other commands.

The static context consists of the following:

Current program	`info sharedlibrary` (GDB mode) or `listobj` (IDB mode), `info file`
Current file	`print $curfile`
Current line	`print $curline`

The dynamic context consists of the following:

`where`	Current call frame
`print $curprocess`	Current process
`print $curthread`	Current thread
`thread`	The thread executing the event that caused the debugger to gain control of the process

The debugger keeps the components of the static and dynamic contexts consistent as the contexts change. The debugger determines the current file and line according to where the process stops, but you can change the dynamic context directly using the following commands:

- `frame` (GDB mode)
- `up` or `down`
- `func` (IDB mode)
- `process` (IDB mode)
- `thread`

You can unload the program using the `file` (GDB mode) or `unload` (IDB mode) command.

See Also

`frame (gdb mode only)`
`up`
`down`
`func (idb mode only)`
`process (idb mode only)`
`thread`
Chapter 8, "List of Predefined Debugger Variables"

Command, Filename and Variable Completion

GDB mode supports the completion of commands, filenames, and variables. Start typing a command, filename or variable and press Tab. If there is more than one alternative, the debugger sounds a bell. Pressing Tab again causes the debugger to list the alternatives.

Using single and double quotes influences the set of possible alternatives. Use single quotes to fill in C++ names, which contains special symbols (":", "<", ">", "(", etc.). Use double quotes to tell the debugger to look for alternatives among file names.

User-defined Commands

The debugger supports user-defined commands.

GDB Mode:

Use the following commands to define and control user-defined commands:

- `define`
- `set max-user-call-depth`
- `show max-user-call-depth`

User-defined commands support `if`, `while`, `loop_break`, and `loop_continue` commands in their bodies. User-defined commands can have up to 10 arguments separated by whitespace. Argument names are `$arg0`, `$arg1`, `$arg2`, …, `$arg9`. The number of arguments is held in `$argc`.

To define a new command:

1. Enter `define` *commandname*.
2. Enter each command line separately.
3. Enter `end`.

NOTE. The debugger does not support user-defined hooks or the following commands: `document`, `help user-defined`, and `dont-repeat`.

IDB Mode:

Use the `alias` command to define or display your own commands.

The definition can contain:

- The name of another alias, if the nested alias is the first identifier in the definition.
- A quoted string, specified with backslashes before the quotation marks. Two quotation marks cannot be together; they must be separated by a space or at least one character.

See Also

alias (idb mode only)
define (gdb mode only)
set max-user-call-depth (gdb mode only)
show max-user-call-depth (gdb mode only)

Changing the Debugger Prompt

By default, the debugger prompt is `(idb)` . You can customize the debugger prompt by setting the `$prompt` debugger variable, or, in GDB mode, using the `set prompt` command.

Example

The following example changes the prompt by setting the `$prompt` debugger variable.

```
(idb) set $prompt = "newPrompt>> "
newPrompt>>
```

See Also

set (idb mode only)
set prompt (gdb mode only)

Processing Debugger Commands

Processing Debugger Commands: Overview

The debugger processes commands as follows:

1. Prompts for input.
2. Obtains a complete line from the input file and performs:
   a. History replacement of the line
   b. Alias expansion of the line
3. Parses the entire line according to the parsing rules for the current language.
4. Executes the commands.

See Also

Entering and Editing Command Lines
History Replacement of the Line (IDB Mode Only)

Environment Variable Expansion
Syntax of Commands: Overview

Entering and Editing Command Lines

The debugger reads lines from `stdin`. The debugger supports command line editing when processing `stdin` if `stdin` is a terminal and the debugger variable `$editline` is non-zero. If you are using the debugger's command-line mode, use the `set` command to change the setting, and set the terminal width to the correct value.

After editing, press Enter to send the line to the debugger.

- Use the left and right arrow keys to edit parts of the line.
- Use the up and down arrow keys to recall and edit earlier commands.

NOTE. When you use the up and down arrow keys, the debugger skips duplicate commands. To see a complete list of the commands you have entered, use the `history` command.

When input is recorded, the debugger copies each line from `stdin` to the file you select with the `record input` command.

The debugger scans each line from the beginning, looking for backslash (\) characters, which escape the subsequent character. If the line ends in an escaped newline, then another line is similarly processed from `stdin` and appended to the first one, with the escaped newline removed.

Whether or not command line editing is enabled, you can always use your terminal's cut-and-paste function to avoid excessive typing while entering input.

See Also

Chapter 8, "List of Predefined Debugger Variables"
`set height (gdb mode only)`
`set width (gdb mode only)`
`history (idb mode only)`
`record (idb mode only)`

History Replacement of the Line (IDB Mode Only)

You can access the debugger's command history to execute repetitive commands more easily.

History in a command list is not limited by braces, but goes all the way back. For example:

```
idb) print 1
1
(idb) stop at 182 { print 2; history 3 }
[#1: stop at "src/x_list.cxx":182 { print 2; history 3 }]
(idb) run
2
11: print 1
12: stop at 182 {print 2; history 3}
13: run
[1] stopped at [int main(void):182 0x08051603]
    182     List<Node> nodeList;
```

NOTE. Commands in breakpoint action lists are not entered into the history list.

See Also

Scripting or Repeating Previous Commands

!

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Environment Variable Expansion

The debugger expands environment variables and the leading tilde (~) in the following cases:

- As part of a command in which a file name or a directory is expected.
- In the arguments to run or rerun (IDB mode).

As in any shell, you can group an environment variable name using a pair of curly braces ({}), and quote a dollar sign ($) by preceding it with a backslash (\).

The following table shows how various environment variables expand. It assumes that the home directory is `/usr/users/hercules` and the environment variable `BIN` is `/usr/users/hercules/bin`.

Table 5-1

Command with Environment	Variable Expands into
`load ~/a.out`	`load /usr/users/hercules/a.out`
`load $BIN/a.out`	`load /usr/users/hercules/bin/a.out`
`load ${BIN}2/a\$b`	`load /usr/users/hercules/bin2/a$b`
`map source directory $BIN ${BIN}2`	`map source directory /usr/users/hercules/bin /usr/users/hercules/bin2`
`stop at "$BIN/a.out":20`	`stop at "/usr/users/hercules/bin/a.out":20`
`run $BIN/a.out ~/core`	`run /usr/users/hercules/bin/a.out /usr/users/hercules/core`

Syntax of Commands

Syntax of Commands: Overview

The debugger has different parsing rules for each of the different languages it supports. A line is processed according to the current language, even if executing the line will change the current language.

Lexical Analysis

For the debugger to parse the line, it must first turn the line into a sequence of tokens, a process called *tokenizing* or *lexical analysis*. Tokenizing is done with a state machine.

As the debugger starts tokenizing a line into a command, it starts processing the characters using the lexical state LKEYWORD. It uses the rules for lexical tokens in this state, recognizing the longest sequence of characters that forms a lexical token.

After the lexical token is recognized, the debugger appends it to the tokenized form of the line, perhaps changes the state of the tokenizer, and starts on the next token.

Grammar of Commands

Some pieces of the grammar were modified from a grammar originally written by James A. Roskind. Portions Copyright ©1989, 1990 James A. Roskind

Each command line must parse as one of the following:

command list	A command list is a sequence of one or more commands that the debugger are executes one after the other.
comment	A comment is a line that begins with a pound (`#`) character. The debugger ignores any text after an unquoted pound character. If the first non-whitespace character on a line is a pound character, the debugger ignores the whole line.

The difference between a blank command line and a command line that is a comment is that a blank line entered from the keyboard causes the debugger to repeat the previous command and the comment line does not. The debugger treats blank lines that you do not not enter directly in the console as comment lines.

Keywords within Commands

If the identifiers `thread`, `in`, `at`, and `if` occur within *`expression`* in the following commands, the debugger treats them as keywords unless they are enclosed within parentheses (`()`).

- `where` *`expression`*
- `stopi` *`expression`*
- `wheni` *`expression`*

For example, if your program has `thread` defined as an integer, enter the following command to inspect the first `thread` levels of the stack:

```
(idb) where (thread)
```

Using Braces to Make a Composite Command

You can surround a list of commands with braces to make it work like a single command. Some parts of the debugger command language grammar require a braced command list either for readability, or to help the debugger understand your input.

Example

```
if (foo) { p "true" } else { print "false" }
while (bar()) {print "bar is still true"}
```

```
stop in rtn { p "in routine" }
```

Conditionalizing Command Execution

To conditionalize command execution, use the `if [else]` and `while` commands.

Example

The following example demonstrates using the `if` command.

```
(idb) set $c = 1
(idb) assign pid = 0
(idb) if (pid < $c) { print "Greater" } else { print "Lesser" }
Greater
```

The following example demonstrates using the `while` command to continue the execution of the debuggee until the `_data` field in `currentNode` is 5.

Notice that if the commands in the braced command list do not change the state of the debuggee process, such as the value of a variable or the PC register, then the `while` command can go into an infinite loop. In this case, press Ctrl+C to interrupt the loop, or enter **n** when you see the `More (n if no)?` prompt if your `while` command generates output and the paging is turned on.

```
(idb) stop at 167
[#1: stop at "src/x_list.cxx":167]
(idb) run
The list is:
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
    167         cout << "Node " << i ;
(idb)
(idb) while (currentNode->_data != 5) { print "currentNode->_data is ",
currentNode->_data; cont }
currentNode->_data is  1
Node 1 type is integer, value is 1
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
    167         cout << "Node " << i ;
currentNode->_data is  2
Node 2 type is compound, value is 12.345
       parent  type is integer, value is 2
```

```
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
    167         cout << "Node " << i ;
currentNode->_data is  7
Node 3 type is compound, value is 3.1415
       parent  type is integer, value is 7
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
    167         cout << "Node " << i ;
currentNode->_data is  3
Node 4 type is integer, value is 3
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
    167         cout << "Node " << i ;
currentNode->_data is  4
Node 5 type is integer, value is 4
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
    167         cout << "Node " << i ;
(idb)
(idb) print currentNode->_data
5
```

See Also

if
while

About Debugger Variables

Debugger variables are pseudovariables that exist within the debugger instead of within your program. They have the following uses:

- Support some limited programming capabilities within the debugger command language
- Allow you to examine and change various debugger options
- Allow you to find out exactly what various debugger commands did

Debugger variables fall into one of the following categories:

User-defined variables You create these and can set them to a value of any type.

Preference variables	You modify these to change debugger behavior. You can only set a preference variable to a value that is valid for that particular variable.
Display/state variables	These variables display the parts of the current debugger state. You cannot modify them.

You can delete and redefine the predefined debugger variables in the same way you define your own variables.

If you delete a predefined debugger variable, the debugger uses the default value for that variable.

The following commands deal specifically with debugger variables:

- `set [variable]`
- `unset`
- help "variable"

The debugger variable name should not exist anywhere in your program, or you may confuse yourself about which of the occurrences you are actually dealing with. The predefined debugger variables all start with a dollar sign (`$`), to help avoid this confusion. It is strongly recommended that you follow the same practice. In a future release, all user-defined debugger variables will be required to start with a dollar sign.

NOTE. If a debugger variable exists that shares a name with a program variable, and you print an expression involving that name, which of the two variables the debugger finds is undefined.

See Also

`set variable (gdb mode only)`
`set (idb mode only)`
`unset (idb mode only)`
Chapter 8, "List of Predefined Debugger Variables"

Scripting or Repeating Previous Commands

Repeating Previous Commands

The debugger maintains a command history, so you can repeat commands that you have already entered in the debugger. This command history persists across debugging sessions.

To repeat the last command line do one of the following:

- Press the up arrow once, then press Enter.
- Enter two exclamation points (`!!`).
- Press Enter.
- Enter `!-1`.

To repeat a command line entered during the current debugging session:

Enter an exclamation point (`!`) followed by either the integer or the first part of the string associated with the command line.

For example, to repeat the seventh command used in the current debugging session, enter `!7`. To repeat the third most recent command, enter `!-3`. To repeat a command that started with `bp`, enter `!bp`.

Tips

- Use a completely empty line to repeat the last command, as opposed to the last line, which could have been a comment or a syntactically invalid attempt at a command.
- Use command line editing to recall and modify commands you have already entered.
- It is often useful to have a text editor up and running while debugging, and use it to assemble short scripts that you can copy and paste to the debugger. Keep a separate text file that has such scripts in it, as well as other notes you want to keep. This provides continuity from one debugging session to the next, and from one day to the next.
- If you place commands in a file, you can execute them directly from the file rather than cutting and pasting them to the terminal.

See Also

History Replacement of the Line (IDB Mode Only)
Viewing the Command History
!
history (idb mode only)

Scripting Commands

You can record input and output to help you make command files and to help you see what has happened before. You can record input only, or input and output. Input includes user actions, including GUI actions and commands you enter in the console.

You can use the GUI to record input and output, or the following commands:

- `record`
- `unrecord`

See Also

playback input (idb mode only)
record (idb mode only)
source
unrecord (idb mode only)

Viewing the Command History

You can see all the commands you have already entered by using the `history` command.

To view the command history:

1. If you are not already in IDB mode, switch to IDB mode using the following command.
   (idb) **`set variable $cmdset = "idb"`**
   The debugger is now in IDB mode, so you can use the history command.
2. Enter the following command:
   (idb) **`history`**
   The debugger displays the command history.
3. If you want to switch to GDB mode, use the following command:
   (idb) **`set $cmdset = "gdb"`**

GDB Mode:

In GDB mode, the debugger reads the `.gdb_history` file by default.

To rename the history file:

Set the environment variable `GDBHISTFILE` to the name of the history file you want to use.

To turn history recording on and off:

Use the `set history save` command.

To configure the history size:

Use the `set history size` command or set the environment variable `HISTSIZE` to the size you want. The default history size is 256.

See Also

History Replacement of the Line (IDB Mode Only)
`history (idb mode only)`
`set history save`
`set history size`

Executing Shell or Command Prompt Commands

You can have the debugger execute a call to the operating system's `system` function. This function is documented in `system(3)`. The call results from the `shell` (GDB mode) or `sh` (IDB mode) commands.

See Also

`shell (gdb mode only)`
`sh (idb mode only)`

Debugging Parallel Applications 6

Working With Thread and Process Sets

Working With Thread and Process Sets: Overview

When many processes are running, it can be annoying or impractical to enumerate all the processes when you need to focus on specific processes.

When defining stopping threads and thread filters for code breakpoints, you need to define sets of threads.

You can specify a set of processes or threads in a compact form, where a set includes one or more ranges. You can execute normal operations on process sets, and debugger variables can store both sets and ranges for manipulation, reference, or inspection.

See Also

Process and Thread Set Notation
Storing Process and Thread Sets in Debugger Variables
Process and Thread Set Operations
Changing the Current Process Set
Predefined Thread Sets
Viewing Threads and Thread Sets
Synchronizing a Set of Threads

Process and Thread Set Notation

The operating system assigns each process a process ID (pid). The debugger assigns each currently running thread an ID.

The debugger does not reuse thread IDs. For example, suppose there are five threads running, with IDs from 1-5. If you kill thread `3`, and then create a new one, the new one has the ID `6`, not `3`.

NOTE. Brackets (`[]`) are part of the process set syntax, so this topic shows optional syntactic items enclosed in curly braces (`{}`).

Specifying Process and Thread Sets

A set of processes or threads comprises one or more contiguous ranges of process or thread IDs, separated by commas.

To specify a process set, use the following notation:

```
[ range {,…} ]
```

To specify a thread set, use the following notation:

```
t:[ range {,…} ]
```

You can express an empty set with empty brackets:

```
[ ]
```

You can specify process and thread sets using expressions, wildcards and by merging thread sets.

Example

The following example contains the first three threads in the current process.

```
t:[1,2,3]
```

The following example specifies a thread set using an expression:

```
t:[1:3+foo()]
```

The following example specifies a merged thread set:

```
t:[*] - t:[1]
```

The following example contains all the threads in the current process.

```
t:[*]
```

The following example contains all the threads in the current process except threads 1 and 6.

```
t:[2:5, 7:]
```

See Also

Working With Thread and Process Sets: Overview
Storing Process and Thread Sets in Debugger Variables
Process and Thread Set Operations
Changing the Current Process Set
Predefined Thread Sets
Viewing Threads and Thread Sets
Synchronizing a Set of Threads

Specifying a Range of Processes or Threads

To specify a consecutive range of processes or threads, use one of the following notations:

`*`	Specifies all processes or threads.
`expression`	If *`expression`* evaluates to, or can be coerced into an integer *`p`*, then the set contains the thread or process with ID *`p`* only. If *`expression`* evaluates to a range *`r`*, then the set is the same as *`r`*.
`{` *`expression`* `} : {` *`expression`* `}`	Specifies a contiguous range of processes or threads. For example, `[10:12]` specifies the processes associated with pids 10, 11, and 12, while `t:[10:12]` specifies the threads with IDs 10, 11, and 12.

NOTE. The debugger ignores a range whose lower bound is greater than its upper bound.

Both the lower bound and the upper bound are optional, so you can specify ranges as follows:

`:`*`n`*	All processes or threads whose ID is no greater than *`n`*. For example, `[:5]` refers to all processes whose pid is less than or equal to 5.
`n``:`	All processes or threads whose pid is no less than *`n`*. For example, `t:[20:]` refers to all processes whose ID is greater than or equal to 20.
`:`	All processes or threads.

Storing Process and Thread Sets in Debugger Variables

You can store process and thread sets in debugger variables using the `set` command. For example:

```
(idb) set $set1 = [:7, 10, 15:20, 30:]
(idb) print $set1
[:7, 10, 15:20, 30:]
```

You can use the `print` command and `show process set` commands to inspect the process set stored in a debugger variable.

If you do not specify the set name, or if you specify `all`, the debugger displays all the process sets that are currently stored in debugger variables, as the continued example shows:

```
(idb) set $set2 = [8:9, 5:2, 22:27]
'5:2' is not a legal process range. Ignored.
(idb) show process set $set2
$set2 = [8:9, 22:27]
(idb) show process set *
$set1 = [:7, 10, 15:20, 30:]
$set2 = [8:9, 22:27]
```

The following example sets a variable, `$myset2`, to a thread set that includes threads 3, 10-20, 50 and the value of `$myset1`.

```
(idb) set $myset2 = t:[3, 10:20, 50:] + $myset1
```

See Also

About Debugger Variables
Working With Thread and Process Sets: Overview
Process and Thread Set Notation
Process and Thread Set Operations
Changing the Current Process Set
Predefined Thread Sets
Viewing Threads and Thread Sets
print
set (idb mode only)
show process set

Process and Thread Set Operations

You can use the following operations on process and thread sets:

Table 6-1 Set Operators

Operation	Represents	Action
+	Set union	Takes two sets *S1* and *S2* and returns a set whose elements are either in *S1* or in *S2*.
–	Difference	Takes two sets *S1* and *S2* and returns a set whose elements are in *S1* but not in *S2*.
unary –	Negation	Takes a single set *S* and returns the difference of `[*]` and *S*.

Example

The following example demonstrates these three operations:

```
(idb) set $set1 = [:10, 15:18, 20:]
(idb) set $set2 = [10:16, 19]
(idb) set $set3 = $set1 + $set2
(idb) print $set3
[*]
(idb) print $set3 - $set2
[:9, 17:18, 20:]
(idb) print -$set2
[:9, 17:18, 20:]
```

Predefined Thread Sets

By default, the debugger includes the following set of debugger variables that enables you to easily access several thread sets. You can use these variables to define your own thread sets:

`$allthreads` All existing debuggee threads.

`$currentlockstepthreads`	The threads that have the same program counter as the current thread.
`$currentopenmpteam`	This does not apply to Mac OS* In OpenMP*, a parallel region creates a thread team. When the current thread is a member of a thread team, then $currentopenmpteam is set to all the threads that are in the same innermost team as the current thread.
`$currentthread`	The current thread. When an event occurs, the debugger sets the current thread to the eventing thread. To make a thread the current thread, double-click it in the Threads window or use the `thread` command.
`$frozenthreads`	The threads that are currently frozen.
`$lasteventingthread`	The thread that triggered the last debug event. A debug event is a breakpoint, syncpoint, signal raising or exception.
`$uninterruptedthreads`	The threads that are marked as uninterrupted.

See Also

Working With Thread and Process Sets: Overview
Process and Thread Set Notation
Storing Process and Thread Sets in Debugger Variables
Process and Thread Set Operations
Changing the Current Process Set
Viewing Threads and Thread Sets
`thread`

Viewing Threads and Thread Sets

To view the contents of a thread set using the GUI:

1. Open the **Threads** window. Select **View > Threads**.
2. Double-click the name of the thread set you want to view.

The thread set expands and shows all the thread sets it includes.

To view the contents of a thread set using the command-line:

Use the `info threads` command.

See Also

Predefined Thread Sets
info threads (gdb mode only)

Synchronizing a Set of Threads

Use thread syncpoints to synchronize a set of threads. When any thread in a thread set reaches a thread syncpoint, the debugger holds that thread, ignoring any attempt to step or continue execution, until all other threads in the thread set reach the thread syncpoint. When all threads in the thread set reach the thread syncpoint, they remain stopped until you continue the process.

If you manually stop execution before all threads in the thread set have reached the thread syncpoint, the debugger continues to hold all threads in the thread set until all of them reach the thread syncpoint.

To synchronize a set of threads:

Set a thread syncpoint.

See Also

Process and Thread Set Notation
idb synchronize (gdb mode only)

Changing the Current Process Set

You can change the current process set using the `focus` command.

See Also

focus (idb mode only)

Finding Bugs in OpenMP* and Serial Code

This topic does not apply to Mac OS*

To determine if a bug is caused by concurrency or if it occurs within an algorithm, it is useful to serialize execution for OpenMP parallel code regions and to restrict execution of these code regions to a single thread per region. You can serialize the code regions dynamically, so you do not need to recompile or restart the OpenMP application.

NOTE. When you enable serialization while the program is executing a parallel region, this region is not serialized—only subsequent regions are. When you disable serialization, only regions subsequent to the current location are set back to parallel. To serialize a selected region, it is useful to set breakpoints before and after the region. This helps you to enable serialization before the selected region is executed, and disable it before other parallel regions are executed. With this selective serialization, the rest of the application can remain parallel, which reduces execution time.

To serialize an OpenMP parallel region:

1. Go to the code region you want to serialize.
2. Set a breakpoint at the line preceding the region and another breakpoint at the line following the region.

   This step helps you to serialize this particular code region.
3. Run or rerun the application.

   The application stops at the first breakpoint.
4. Enable serialization: Enter `idb set openmp-serialization on`.
5. Continue debugging.

   The application stops at the next breakpoint. Only a single thread executed the region.
6. Disable serialization: Enter `idb set openmp-serialization off`.

All subsequent OpenMP parallel regions are executed by multiple threads until you enable serialization again.

NOTE. You must enable serialization at the first breakpoint and disable serialization at the second breakpoint each time you want to run this same region serially.

See Also

`idb set openmp-serialization (gdb mode only)`
`idb show openmp-serialization (gdb mode only)`

Viewing OpenMP* Information

This topic does not apply to Mac OS*

The debugger enables you to view the following information about an OpenMP application:

Table 6-2 Viewing OpenMP* Information

Information	Use this command
threads	idb info thread (gdb mode only)
tasks	idb info task (gdb mode only)
barriers	idb info barrier (gdb mode only)
taskwaits	idb info taskwait (gdb mode only)
locks	idb info lock (gdb mode only)
teams	idb info team (gdb mode only)
parent/child relationship	idb info openmp thread tree (gdb mode only)

IDB Command Reference 7

Click a command to see a detailed description.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
address / size format (idb mode only)	Dump memory in a range you specify.
/ | ? [string] (idb mode only)	Search in the source for a string, or repeat the last search.
!	Repeat a command in the command history.
^	Find and change a command in the command history.
#	Specify a comment.
add-shared-symbol-file (gdb mode only)	Add a shared library.
add-symbol-file (gdb mode only)	Read additional symbol table information from a file.
advance (gdb mode only)	Run until the debuggee reaches a specific line number.
alias (idb mode only)	Define an alias for one or more commands.
assign (idb mode only)	Change a program variable.
attach	Connect to a running process.
awatch (gdb mode only)	Set a watchpoint on a specified expression.
backtrace (gdb mode only)	Print a backtrace of stack frames.
break (gdb mode only)	Set a breakpoint at a specified location.
call	Call a function in the debuggee.
catch (idb mode only)	Catch a signal.
catch unaligned (idb mode only)	Catch unaligned accesses.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
class (idb mode only)	Show or change the current class scope.
clear (gdb mode only)	Delete a breakpoint at the specified location.
commands (gdb mode only)	Create commands to be executed when the specified breakpoint is reached.
complete (gdb mode only)	List all the possible completions for the beginning of a command.
condition (gdb mode only)	Specify a condition for a breakpoint.
cont (idb mode only)	Continue program execution.
conti (idb mode only)	Continue program execution until a specific address.
continue (gdb mode only)	Continue program execution.
core-file (gdb mode only)	Specify a core file as a target, or specify not to use a core file.
define (gdb mode only)	Create a user-defined command.
delete (idb mode only)	Delete all or specific breakpoints.
delete breakpoint (gdb mode only)	Delete all or specific breakpoints.
delete display (gdb mode only)	Delete the specified items from the display list.
delsharedobj (idb mode only)	Delete symbol information for a shared object.
detach	Detach the debugger from a running process.
directory (gdb mode only)	Add directories to the list of source directories.
disable	Disable one or more breakpoints.
disable display (gdb mode only)	Disable displaying the specified items.
disassemble (gdb mode only)	Disassemble and display machine instructions.
disconnect (gdb mode only)	Disconnect from all running processes and remove all breakpoints.
display (gdb mode only)	Add the specified item to the display list.
down	Move a number of frames down the stack and print them.
down-silently (gdb mode only)	Move a number of frames down the stack but do not print them.
dump (idb mode only)	List the parameters and local variables on the stack.
echo (gdb mode only)	Print a string.
edit (idb mode only)	Edit the current source file or a specified file.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
enable	Enable one or more breakpoints.
enable display (gdb mode only)	Enable displaying the specified items.
exit (idb mode only)	Exit the debugger.
expand aggregated message (idb mode only)	Expand the specified or most recent message.
export (idb mode only)	Set an environment variable or print all variables.
file (gdb mode only)	Load an executable file for debugging, or unload.
file (idb mode only)	Switch to the specified source file.
fileexpr (idb mode only)	Switch to the specified source file.
finish (gdb mode only)	Continue execution until the current function returns.
focus (idb mode only)	Change or display the current process set.
forward-search (gdb mode only)	Search forward in the source for a string or repeat last search.
frame (gdb mode only)	Show or change the current function scope.
func (idb mode only)	Show or change the current function scope.
goto (idb mode only)	Skip to a specific line number.
handle (gdb mode only)	Set signal handling actions.
help	Display help for debugger commands.
history (idb mode only)	Show the most recently used debugger commands.
idb directory (gdb mode only)	Add a directory to the list of source directories or reset the list.
idb freeze (gdb mode only)	Set the execution attribute of the specified threads to `frozen`.
idb info barrier (gdb mode only)	Shows information for existing barriers in an OpenMP application.
idb info lock (gdb mode only)	Shows information for existing locks in an OpenMP application.
idb info openmp thread tree (gdb mode only)	Display the threads in the process in a tree format.
idb info task (gdb mode only)	Display information for existing tasks in an OpenMP application.
idb info taskwait (gdb mode only)	Display information for any existing taskwait.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
idb info team (gdb mode only)	Display information for any existing team.
idb info thread (gdb mode only)	Show the specified threads in the process.
idb process (gdb mode only)	Show or specify a process.
idb session restore (gdb mode only)	Load a session file to restore a session's debug settings.
idb session save (gdb mode only)	Save a session's debug settings to a file.
idb set openmp-serialization (gdb mode only)	Enable or disable serial execution of parallel regions in an OpenMP* process.
idb show openmp-serialization (gdb mode only)	Show if serialization of parrallel regions in an OpenMP process is enabled.
idb set openmp-serialization (gdb mode only)	Show if serialization of parrallel regions in an OpenMP process is enabled.
idb show solib-path-substitute (gdb mode only)	Show the replacement directory for loading shared libraries.
idb stopping threads (gdb mode only)	Specify the threads that stop when a breakpoint is hit.
idb synchronize (gdb mode only)	Set a thread syncpoint at a location you specify.
idb target threads (gdb mode only)	Specify the threads that subsequent mover commands apply to.
idb thaw (gdb mode only)	Set the execution attribute of the specified threads to `thawed`.
idb uninterrupt (gdb mode only)	Set the execution attribute of the specified threads to `uninterrupt`.
idb unset solib-path-substitute (gdb mode only)	Remove a path substitution rule.
if	Conditionalize command execution.
ignore (gdb mode only)	Set the ignore count of the specified breakpoint or watchpoint to the specified value.
ignore (idb mode only)	Ignore the specified signal.
info args (gdb mode only)	Print the arguments of the current frame.
info breakpoints (gdb mode only)	Print information about one or more breakpoints.
info display (gdb mode only)	Print a list of expressions on display.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
info files (gdb mode only)	Print the names of the files in the debuggee.
info functions (gdb mode only)	Print names and types of functions.
info handle (gdb mode only)	Print signal setting information.
info line (gdb mode only)	Print start and end address of specified source line.
info locals (gdb mode only)	Print local variables of the selected function.
info program (gdb mode only)	Print information about the debuggee.
info registers (gdb mode only)	Print registers and their contents.
info share (gdb mode only)	Print the names of shared libraries.
info sharedlibrary (gdb mode only)	Print the names of shared libraries.
info signals (gdb mode only)	Print signal setting information.
info source (gdb mode only)	Print information about the current source file.
info sources (gdb mode only)	Print names of all source files.
info stack (gdb mode only)	Print a backtrace of stack frames.
info target (gdb mode only)	Print the names of the files in the debuggee.
info threads (gdb mode only)	Print all threads.
info types (gdb mode only)	Print a description of types in the program.
info variables (gdb mode only)	Print names and types of all global variables.
info watchpoints (gdb mode only)	Print information about one or more watchpoints.
jump (gdb mode only)	Jump to the specified line number or address.
kill	Kill the current process.
list	Display lines of source code.
listobj (idb mode only)	List all loaded objects, including the main image and the shared libraries.
load (idb mode only)	Load an executable and core file for debugging.
map source directory (idb mode only)	Map one source directory to another one.
next	Step forward in source, over any function calls.
nexti	Step forward in assembler instructions, over any function calls.
output (gdb mode only)	Print the value of an expression.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
patch (idb mode only)	Modify an executable by writing the value of an expression to a specific address.
path (gdb mode only)	Add specified directory to search path.
playback input (idb mode only)	Execute commands from a file.
pop (idb mode only)	Remove frames from the call stack.
print	Print the value of an expression.
printenv (idb mode only)	Display the value of one or all environment variables.
printf	Display a complex structure with formatting.
printi	Display the value as an assembly instruction.
printregs (idb mode only)	Display the values of hardware registers.
printt (idb mode only)	Interpret integer values as seconds since the Epoch.
process (idb mode only)	Show or change the current process.
ptype (gdb mode only)	Print the type declaration of the specified type, or the last value in history.
pwd (gdb mode only)	Display the current working directory.
quit	Exit the debugger.
readsharedobj (idb mode only)	Read symbol information for a shared object.
record (idb mode only)	Record debugger interactions to a file.
rerun (idb mode only)	Restart the program.
return (gdb mode only)	Remove frames from the call stack.
return (idb mode only)	Continue execution until the current or specified function returns.
reverse-search (gdb mode only)	Search backward in the source for a string or repeat last search.
run	Run the debuggee program.
rwatch (gdb mode only)	Set a read watchpoint on the specified expression.
search (gdb mode only)	Search forward in the source for a string or repeat last search.
set (idb mode only)	Set a debugger variable to a value or show all debugger variables.
set args (gdb mode only)	Specify arguments for the debuggee program.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
set confirm (gdb mode only)	Switch confirmation requests on or off.
set editing (gdb mode only)	Enable or disable Emacs*-like control characters.
set environment (gdb mode only)	Set an environment variable to a value.
set height (gdb mode only)	Set the height of the screen.
set history save	Switch command-line history on or off.
set history size	Specify the size of the command-line history.
set language (gdb mode only)	Set the source language.
set listsize (gdb mode only)	Set the default number of source lines for the list command to display.
set max-user-call-depth (gdb mode only)	Set a limitation on the number of recursion levels for user call depth.
set output-radix (gdb mode only)	Set the default numeric base for numeric output.
set print address (gdb mode only)	Set the debugger's default to either print or not print the value of a pointer as an address.
set print elements (gdb mode only)	Set a limit on the number of array elements to print.
set print repeats (gdb mode only)	Limit the number of consecutive, identical array elements the debugger prints.
set print static-members (gdb mode only)	Print static members when showing a C++ object.
set prompt (gdb mode only)	Set a new string for the debugger prompt.
set substitute-path (gdb mode only)	Set a substitution rule for finding source files.
set variable (gdb mode only)	Set a debugger variable to a value.
set width (gdb mode only)	Set the width of the screen.
setenv (idb mode only)	Set the value of an environment variable.
sh (idb mode only)	Execute a shell command.
shell (gdb mode only)	Execute a shell command.
show aggregated message	Print the specified aggregated messages.
show architecture (gdb mode only)	Show the current architecture.
show args (gdb mode only)	Show arguments and input and output redirections.
show commands (gdb mode only)	Print commands in history.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
show condition (idb mode only)	List information about pthreads condition variables.
show convenience (gdb mode only)	Show a list of debugger variables and their values.
show directories (gdb mode only)	Show the list of source directories to search.
show editing (gdb mode only)	Show whether command line editing is on or off.
show environment (gdb mode only)	Show one or all environment variables.
show height (gdb mode only)	Show the height of the screen.
show language (gdb mode only)	Show the current source language.
show listsize (gdb mode only)	Show the default number of lines for the list command.
show lock (idb mode only)	List information about OpenMP* locks.
show max-user-call-depth (gdb mode only)	Show the maximum recursion level for user-defined commands.
show mutex (idb mode only)	Show information about pthreads mutexes.
show openmp thread tree (idb mode only)	Display the threads in the process in a tree format.
show output-radix (gdb mode only)	Show the default numeric base for numeric output.
show print address (gdb mode only)	Show whether addresses are set to be printed.
show print elements (gdb mode only)	Show the maximum number of array elements the debugger is set to print.
show print repeats (gdb mode only)	Show the the current threshold of repeated identical elements that the debugger is set to print.
show print static-members (gdb mode only)	Show the current status of the printing of static class members.
show process (idb mode only)	List process information.
show process set	List information about one or all process sets.
show prompt (gdb mode only)	Show the current debugger prompt.
show source directory (idb mode only)	List information about directory mappings.
show team (idb mode only)	List information about OpenMP* teams.
show thread (idb mode only)	List information about a thread.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
show user (gdb mode only)	Show the definition of one or all user-defined commands.
show values (gdb mode only)	Show ten values of the value history.
show width (gdb mode only)	Show the width of the screen.
source	Execute commands from a batch file.
status (idb mode only)	Print info on all breakpoints and tracepoints.
step	Step forward in source, into any function calls.
stepi	Step forward in assembler instructions, into any function calls.
stop at (idb mode only)	Set a breakpoint at a line number or expression.
stop every (idb mode only)	Set a breakpoint on every function entry point or on every instruction.
stop in (idb mode only)	Set a breakpoint in a function.
stop memory (idb mode only)	Set a breakpoint on a region in memory.
stop pc (idb mode only)	Set a breakpoint when PC equals a specific address.
stop signal (idb mode only)	Set a breakpoint on a signal.
stop unaligned (idb mode only)	Set a breakpoint on unaligned accesses.
stop variable (idb mode only)	Set a breakpoint on a specific variable.
stopi (idb mode only)]	Set a breakpoint at an instruction, or if a variable changes.
symbol-file (gdb mode only)	Load a symbol table from the specified executable file.
target core (gdb mode only)	Specify a core file as a target.
target remote (gdb mode only)	Attach to a remote process.
tbreak (gdb mode only)	Set a temporary breakpoint at specified location.
thread	Show or change the current thread.
unalias (idb mode only)	Remove an alias.
undisplay (gdb mode only)	Remove the specified items from the display list.
unload (idb mode only)	Unload an image or a core file from the debugger.

Table 7-1 Summary of IDB Commands

Command Name	Short Description
unmap source directory (idb mode only)	Remove a directory mapping.
unrecord (idb mode only)	Stop recording debugger input, output, or both.
unset (idb mode only)	Delete the specified debugger variable.
unset environment (gdb mode only)	Delete the specified environment variable.
unset substitute-path (gdb mode only)	Unset a source directory substitution rule.
unsetenv (idb mode only)	Delete the specified environment variable, or all.
until (gdb mode only)	Run until a specific line.
unuse (idb mode only)	Remove the specified directories from the source path or set path to default.
up	Move a specific number of frames up the stack and print them.
up-silently (gdb mode only)	Move a specific number of frames up the stack but do not print them.
use (idb mode only)	Add a directory to the source path, or show directories in the source path.
watch (gdb mode only)	Set a write watchpoint on the specified expression.
watch (idb mode only)	Set a watchpoint on the specified variable or memory range.
whatis	Print the type of a variable.
when (idb mode only)	Set a breakpoint that executes a command list when it is hit.
wheni (idb mode only)	Set an instruction breakpoint that executes a command list when it is hit.
where (idb mode only)	Show the current stack trace of currently active functions.
whereis (idb mode only)	Show all declarations of a specific expression.
which (idb mode only)	Show the full scope of an expression.
while	Execute the command list while the specified expression is not zero.
x (gdb mode only)	Print memory at the specified address.

address / size format (idb mode only)

Dump memory in a range you specify.

Syntax

```
start_address / size format
start_address, end_address / format
```

Parameters

start_address — The start address for the range of memory.

end_address — The start address for the range of memory.

size — The number of memory values of the specified format to dump. This number is an integer constant.

The default value is `1`

format — The numerical format in which the debugger displays memory values.

Possible values are:

- `d` Print a short word in decimal
- `dd` Print a 32-bit (4-byte) decimal display
- `D` Print a long word in decimal
- `u` Print a short word in unsigned decimal
- `uu` Print a 32-bit (4-byte) unsigned decimal display
- `U` Print a long word in unsigned decimal
- `o` Print a short word in octal
- `oo` Print a 32-bit (4-byte) octal display
- `O` Print a long word in octal
- `x` (Default) Print a short word in hexadecimal
- `xx` Print a 32-bit (4-byte) hexadecimal display
- `X` Print a long word in hexadecimal
- `b` Print a byte in hex
- `c` Print a byte as a character
- `s` Print a string of characters (a C-style string ending in null)
- `C` Print a wide character as a character
- `S` Print a null terminated string of wide characters
- `f` Print a single-precision real number
- `g` Print a double-precision real number
- `L` Print a long double-precision real number
- `i` Disassemble machine instructions

The default format is `x`

Description

This command dumps memory in a range that you specify with a start address and size. It also enables you to specify the numerical format in which the debugger prints the memory range.

Example

```
(idb) 0x81c146f / 1 u
0x081c146f:  60547
(idb) 0x81c146f / 4 u
0x081c146f:  60547  63716  33540  30089
(idb) 0x81c146f, 0x81c147f /  u
0x081c146f:  60547  63716  33540  30089  64605
```

See Also

disassemble (gdb mode only)
x (gdb mode only)

/ | ? [*string*] (idb mode only)

Search in the source for a string, or repeat the last search.

Syntax

```
/ [stringm|M]
? [stringm|M]
```

Parameters

`/`	Tells the debugger to search forward.
`?`	Tells the debugger to search backward.
`string`	Specifies the string you want to search for. If you do not specify *`string`*, the debugger repeats the most recent search.
`m`	Searches a 32-bit chunk of memory.
`M`	Searches a 64-bit chunk of memory.

Description

This command searches forward or backward, starting at the current position in the current source file for the specified character string. If you do not specify a string, the debugger repeats the most recent search.

The debugger interprets anything on the same line after the `/` as the search string, so do not quote the string. The debugger performs alias expansion on the rest of the line before the `/`, possibly changing the search string. For example, suppose you have **`j =`** in your source code.

```
(idb) alias zzz "/j"
(idb) zzz =
```

`zzz` expands to `/j =` and finds the next instance of "j =" in the source code.

When a match is found, the debugger lists the line number and the line. That line becomes the starting point for any further searches, or for a list command.

Examples

This example demonstrates three separate forward searches and their results.

```
(idb) /_firstNode
60 NODETYPE* _firstNode;
(idb) /append
```

```
65 void append (NODETYPE* const node)
(idb) /
145 void List<NODETYPE>::append(NODETYPE* const node)
```

This example demonstrates three separate backward searches and their results.

```
(idb) ?append
145 void List<NODETYPE>::append(NODETYPE* const node)
(idb) ?
65 void append (NODETYPE* const node);
(idb) ?_firstNode
60 NODETYPE* _firstNode;
```

See Also

forward-search (gdb mode only)
reverse-search (gdb mode only)

!

Repeat a command in the command history.

Syntax

```
!!
![-]step_number
!string
```

Parameters

step_number	The number of steps backward or forward in the history. When you include a minus (-), the debugger starts with the most recent command in the history and counts backwards. When you do not include a minus, the debugger starts with the oldest command in the history and counts foward.
string	The string that begins the line in the history that you want to repeat.

Description

The exclamation point (!) repeats a command in the debugger's command history.

The debugger assembles lines in the history into a new, usable command according to the following rules.

- If the second character is also an exclamation point, the assembled line is replaced by the most recent entry from the history list. The debugger appends any remaining characters after the exclamation point to the assembled line.
- The debugger ignores spaces and tabs immediately following the exclamation point, and executes one of the following actions:
  - If the next character is a number, then the debugger reads the number as a decimal number, and replaces the assembled line with the line in the history list whose ID matches the number, where 1 is the oldest entry, 2 the second oldest and so on.
  - If the next character is a minus (-) followed by a number, then the debugger reads the number as a decimal number, and replaces the assembled line with the line in the history list whose ID matches the number, where -1 is the most recent entry, -2 the second most recent entry and so on.
  - The debugger uses the rest of the line to find the most recent command that starts with those characters, and replaces the assembled line with that line from the history list.

In the first two cases, any remaining characters after the exclamation point or digits are appended to the assembled line.

You cannot use exclamation points in command lists built with braces (`{}`), although you can use them in scripts. For example, the command line `{print 3; !!3}` does not parse.

Examples

To repeat the seventh command used in the current debugging session, enter `!7`.

To repeat the third most recent command, enter `!-3`.

To repeat a command that started with `bp`, enter `!bp`.

See Also

"Repeating Previous Commands" in Chapter 5
Viewing the Command History
`history (idb mode only)`

^

Find and change a command in the command history.

Syntax

```
^ string1 [^ string2 [^ string3]]
```

Parameters

string1	The target string.
string2	The replacement string. This string can have a zero length.
string3	The string to append.

Description

The caret (^) finds and changes a command in the debugger's command history.

The debugger ignores leading spaces and tabs and assembles lines in the history into a new, usable command in the following manner:

1. The debugger extracts the following:
   - The string following the first caret, *string1*, the target string.
   - The string following the second caret, *string2*, the replacement string.
   - The string following the third caret, the string to append to the replacement string.
2. The debugger checks the most recent entry from the history list to see if it has an occurrence of the target string. If it does, the debugger appends *string3* to *string2*. If it does not, an error is reported.

The assembled line is now appended to the history list.

You cannot use carets in command lists built with braces ({}), although you can use them in scripts. For example, the command line `{print 3; ^3^4^}` does not parse.

See Also

"History Replacement of the Line (IDB Mode Only)" in Chapter 5

!

# #

Specify a comment.

Syntax

```
# string
```

Parameters

string	A string ending with a newline.

Description

The pound sign (#) specifies a comment. The debugger ignores any text after an unquoted pound sign.

When the first non-whitespace character on a line is a pound character, the debugger ignores the whole line.

Comments are useful in input files.

add-shared-symbol-file (gdb mode only)

Add a shared library.

Syntax

```
add-shared-symbol-file filename
```

Parameters

filename	The name of the shared symbol file.

Description

This command specifies a shared symbol file to use when debugging an application. The debugger searches for shared libraries automatically. Use this command if it does not find any.

See Also

add-symbol-file (gdb mode only)
file (gdb mode only)

add-symbol-file (gdb mode only)

Read additional symbol table information from a file.

Syntax

```
add-symbol-file filename
```

Parameters

filename	File from which to read symbol table information.

Description

This command only works when debugging a remote target that runs on `gdbserver`.

This command reads additional symbol table information from a file you specify.

Use this command when the debuggee dynamically loads the symbol file and you need to tell the debugger what to load and from where to load it in order to use the debugging information.

The debugger adds the file's symbol table to the symbol table it originally read as a result of the `symbol-file` command.

You can use this command any number of times. The debugger keeps adding new symbol data it reads to the old. To discard all old symbol data instead of adding to it, use the `symbol-file` command with no arguments.

You can load symbolic information from shared library files, an executable, or some other object file that has been fully relocated for loading into a process, as long as the file meets all the following requirements:

- The symbolic information in the file refers only to linker symbols that that file defines, not to symbols that other object files define.
- Any file sections that the new file's symbolic debug information refers to have already been loaded from the debuggee.
- You can specify the base address at which every such section was loaded in the `add-symbol-file` command.

See Also

`add-shared-symbol-file (gdb mode only)`
`symbol-file (gdb mode only)`

advance (gdb mode only)

Run until the debuggee reaches a specific line number.

Syntax

```
advance linenumber
```

Parameters

linenumber	The line number in source code at which the debuggee should stop.

Description

This command advances the application until it reaches a specific line number in source code, or until a breakpoint, if a breakpoint comes earlier than *linenumber*.

See Also

until (gdb mode only)
next

alias (idb mode only)

Define an alias for one or more commands.

Syntax

```
alias [alias_name]
alias [alias_name [(argument)] "string"]
```

Parameters

alias_name	Name of the alias to display or define.
argument	An argument for the alias.
string	Value to assign to the alias.

Description

This command defines an alias for one or more commands, or displays one or all existing aliases.

To display all existing aliases and their definitions, enter this command without any parameters.

To display the definition of a specific alias, specify the *alias_name* parameter.

To define a new alias, or redefine an existing alias, use the *string* parameter, and optionally include an argument in the alias with the *argument* parameter.

The definition can contain:

- The name of another alias, if the nested alias is the first identifier in the definition.
- A quoted string, specified with backslashes before the quotation marks. Two quotation marks cannot be together; they must be separated by a space or at least one character.

The debugger does not give a warning if the *alias_name* already has a definition as an alias. The new definition replaces the old one.

Invoke the alias by entering the alias name.

Examples

The following example shows how to define and use an alias:

```
(idb) alias cs
alias cs is not defined
(idb) alias cs "stop at 186; run"
```

```
(idb) cs
[#1: stop at "x_list.cxx":186 ]
[1] stopped at [int main(void):186 0x120002420]
186 IntNode* newNode = new IntNode(1);
```

The following example further modifies the `cs` alias to specify the breakpoint's line number when you enter the `cs` command:

```
(idb) alias cs (x) "stop at x; run"
(idb) cs(186)
[#2: stop at "x_list.cxx":186 ]
Process has exited
[2] stopped at [int main(void):186 0x120002420]
186 IntNode* newNode = new IntNode(1);
```

The following example demonstrates defining an alias with and without an argument, nesting an alias, and invoking an alias with an argument:

```
(idb) alias begin "stop in main; run" # Define the alias "begin" to set a
breakpoint in main, then run the application.
(idb) alias pv(x) "begin; print(x)" # Define the alias "pv" to invoke
"begin", then print an argument.
(idb) pv(i) # Invoke "pv" with i as an argument.
```

The following two examples define aliases with definitions that contain quoted strings, and then display the definitions:

```
(idb) alias ada "ignore sigalrm; ignore sigfpe; set $lang=\"Ada\";"
(idb) alias ada
ada ignore sigalrm; ignore sigfpe; set $lang="Ada";


(idb) alias x "set $lang=\"C++\" "
(idb) alias x
x set $lang="C++"
```

Notice that in the first example there is a semicolon between the last two quotation marks. In the second example there is a space. The two quotation marks cannot be together. They must be separated by a space or character.

See Also

unalias (idb mode only)
define (gdb mode only)

assign (idb mode only)

Change a program variable.

Syntax

```
assign target = ["filename"]value
```

Parameters

target	The variable, memory address, expression, or data member to be changed. This target can include a class name, object, pointer, or any other expression that describes how to access the memory that is to be assigned a value. Use the normal language syntax to specify the target. For example, if you are targeting a class member variable, use `classname::variable`.
value	The new value for the variable, memory address, or expression.
filename	The name of the source code file that includes the variable you want change. You can include this parameter when you want to refer to a rescoped expression.

Description

This command changes the value of a program variable, memory address, or expression that is accessible according to the scope and visibility rules of the language. The expression can be any expression that is valid in the current context.

For C++, use the `assign` command to modify static and object data members in a class, and variables declared as reference types, type const, or type static. You cannot change the address referred to by a reference type, but you can change the value at that address.

Do not use the `assign` command to change the PC. When you change the PC, no adjustment to the contents of registers or memory is made. Because most instructions change registers or memory in ways that can impact the meaning of the application, changing the PC is very likely to cause your application to calculate incorrectly and arrive at the wrong answer. Access violations and other errors and signals may result from changing the value in the PC.

Example

```
(idb) assign x = 0
(idb) assign p->s.f[i] = 1
(idb) assign A::B::m = 2
(idb) assign *((int *) 0x12345678) = 4
```

See Also

set variable (gdb mode only)

attach

Connect to a running process.

Syntax

GDB Mode:

`attach` *`processid`*

IDB Mode:

`attach` *`processid`* [*`filename`*]

Parameters

`processid`	The ID of the process to which you want to connect.
`filename`	IDB mode only. The name of the executable file of the process. You may omit *`filename`* only if the debugger has already loaded the file. If a file name is not specified, the debugger uses the current executable. If the executable contains symbolic debug information, the debugger reads it while attaching.

Description

This command attaches the debugger to a process that is already running. You may find this necessary when you are debugging your application from outside of the debugger and find a bug.

Once you attach the debugger to a process, the process continues execution until it raises a signal that the debugger intercepts, such as SEGV. If you have set the `$stoponattach` debugger variable, the process stops immediately.

Examples

GDB Mode:

```
(idb) file a.out
(idb) attach 8492
```

IDB Mode:

```
(idb) attach 8492 a.out
```

See Also

detach
disconnect (gdb mode only)

"$stoponattach" in Chapter 8

awatch (gdb mode only)

Set a watchpoint on a specified expression.

Syntax

```
awatch expr
```

Parameters

expr	The expression on which to set the watchpoint.

Description

This command sets a watchpoint on the specified expression. When the debuggee reads the value of the specified expression or writes to it, it stops.

Watchpoints are also referred to as *data breakpoints*.

See Also

rwatch (gdb mode only)
watch (gdb mode only)
watch (idb mode only)

backtrace (gdb mode only)

Print a backtrace of stack frames.

Syntax

```
backtrace [full] [num]
```

Parameters

`full`	Instructs the debugger to print the values of the local variables.
num	The number of stack frames to print, starting from the most recent.

Description

This command prints a backtrace, which illustrates how your program arrived at its present position.

When you do not include any parameters, the debugger displays a backtrace of the entire call stack, for all frames in the stack, printing one line per frame.

To stop the backtrace, press the Pause key.

Example

The following example prints the last three frames in the call stack.

```
(idb) backtrace 3
#0  0x08051c7c in IntNode::printNodeData (this=0x805c500) at
src/x_list.cxx:94
#1  0x0804af73 in List<Node>::print (this=0xbfffa330) at
src/x_list.cxx:168
#2  0x08051a3c in main () at src/x_list.cxx:203
```

See Also

down
down-silently (gdb mode only)
info stack (gdb mode only)
up
up-silently (gdb mode only)

break (gdb mode only)

Set a breakpoint at a specified location.

Syntax

```
break [{func | line | *addr}] [if cond] [thread thread]
```

Parameters

func	The name of a function.
line	A line number in a source code file.
addr	An address.
cond	A conditional expression. Execution stops when the debugger hits the specified location and this condition evaluates to TRUE.
thread	A thread ID.

Description

This command sets a breakpoint.

Whenever the program execution hits a breakpoint, the debugger suspends execution and waits for a command.

You can set a breakpoint at the entry of a particular function or at a source code line.

If you do not specify any parameters, the debugger sets the breakpoint at the next instruction to be executed.

Example

```
(idb) break 200
Breakpoint 2 at 0x805197a: file src/x_list.cxx, line 200.
(idb) continue
Continuing.
Breakpoint 2, main () at src/x_list.cxx:200
200 CompoundNode* cNode2 = new CompoundNode(10.123, 5);
```

See Also

clear (gdb mode only)
commands (gdb mode only)
condition (gdb mode only)
delete breakpoint (gdb mode only)

disable
enable
help
idb synchronize (gdb mode only)
ignore (gdb mode only)
info breakpoints (gdb mode only)
stop every (idb mode only)
tbreak (gdb mode only)

call

Call a function in the debuggee.

Syntax

`call` *`expression`* `(`*`parmlist`*`)`

Parameters

`expression`	Expression denoting a function
`parmlist`	List of parameters

Description

Specify the function as if you were calling it from within the application. If the function has no parameters, specify empty parentheses (`()`).

For multithreaded applications, the debugger calls the function in the context of the current thread. For C++ applications, when you set the `$overloadmenu` debugger variable to 1 and call an overloaded function, the debugger lists the overloaded functions and calls the function you specify. For class methods, you also need to specify the class instance. For example:

`call` *`classInstance.methodName`*`(` *`parmlist`* `)`

When the function you call completes normally, the debugger restores the stack and the current context that existed before the function was called.

The `call` command executes the specified function with the parameters you supply and then returns control to the debugger prompt when the function returns. The `call` command discards the return value of the function. If you embed the function call in the expression argument of a print command, the debugger prints the return value after the function returns.

While the program counter is saved and restored, calling a function does not shield the program state from alteration if the function you call allocates memory or alters global variables. If the function affects global program variables, for instance, those variables will be changed permanently.

NOTE. Functions compiled without the debugger option to include debugging information may lack important parameter information and are less likely to yield consistent results when called.

Example

In the following example, the call command results in the return value being discarded while the embedded call passes the return value of the function to the print command, which in turn prints the value.

```
(idb) call earth->distance()
(idb) print earth->distance()
149600
```

See Also

print
"$overloadmenu" in Chapter 8

catch (idb mode only)

Catch a signal.

Syntax

```
catch [signal_ID]
```

Parameters

signal_ID	The signal for the debugger to catch and handle.

Description

This command catches and handles the specified signal. You can specify the signal by integer number or by standard signal name, with or without the prefix `SIG`. The `catch` command is equivalent to the breakpoint command `stop signal`: For example, the command `catch ILL` is similar to `stop signal SIGILL`.

The `catch` and `stop signal` commands differ in the following ways:

- The debugger doesn't make an entry in the breakpoint table for a `catch` command.
- A `catch` for a signal that is already being caught does not create an additional breakpoint for that signal.

A `catch` command without any parameter lists all signals currently being handled.

Example

```
(idb) catch
INT, ILL, ABRT, FPE, SEGV, TERM, QUIT, TRAP, BUS, SYS, PIPE, URG, STOP,
TTIN, TTOU, XCPU, XFSZ, PROF, USR1, USR2, VTALRM
```

See Also

catch unaligned (idb mode only)
ignore (idb mode only)
stop signal (idb mode only)
stop every (idb mode only)

catch unaligned (idb mode only)

Catch unaligned accesses.

Syntax

```
catch unaligned
```

Parameters

None

Description

This command catches unaligned accesses. It is very similar to the `stop unaligned` command.

This command differs from a normal `catch` command in the following ways:

- `unaligned` is not the name of a signal.
- There is no corresponding signal number.
- `unaligned` is never listed by either the `catch` or `ignore` commands without an argument.

Like other `catch` commands, the following rules apply:

- The debugger doesn't make an entry in the breakpoint table for a `catch` command.
- Repeating the command does not create an additional breakpoint.

You cannot specify `unaligned` in a signal detector of a normal breakpoint definition.

The default is `catch unaligned`. To override the default and tell the debugger to ignore unaligned accesses, use the following command:

```
(idb) ignore unaligned
```

However, if a breakpoint was defined using an unaligned access detector, then it must be disabled using a `disable` or `delete` breakpoint command.

Unaligned accesses are automatically handled and quietly corrected on Linux* OS. The debugger cannot catch these events.

See Also

ignore (idb mode only)
catch unaligned (idb mode only)
delete (idb mode only)
disable
stop every (idb mode only)

stop unaligned (idb mode only)

class (idb mode only)

Show or change the current class scope.

Syntax

```
class [name]
```

Parameters

name	Name of a class. This parameter is optional only when there is a current class.

Description

This command lets you set the scope to a class in the program you are debugging. If you do not specify the class name, the command displays the current class context.

NOTE. Setting the class scope nullifies the function scope and vice versa. To return to the default (current function) scope, use the command `func 0`.

Example

This example shows how to use the class command to set the class scope to `List<Node>`. This makes member function append visible so a breakpoint can be set in append.

```
(idb) stop in append
Symbol "append" is not defined.
append has no valid breakpoint address
[#1: stop in append] pending
(idb) class List<Node>
class List<Node> {
class Node* _firstNode;
List(void);
void append(class Node* const);
void print(void) const;
~List(void);
(idb) stop in append
[#2: stop in void List<Node>::append(class Node* const)]
```

See Also

func (idb mode only)

clear (gdb mode only)

Delete a breakpoint at the specified location.

Syntax

```
clear [ { funcname | num } ]
```

Parameters

funcname	The name of a function
num	The number of a source code line

Description

This command removes any breakpoints at the specified line number or function entry. If you do not specify any parameter, it removes the breakpoints from the next instruction to be executed.

Example

```
(idb) clear main
```

See Also

break (gdb mode only)
delete (idb mode only)
delete breakpoint (gdb mode only)
disable
ignore (gdb mode only)
info breakpoints (gdb mode only)

commands (gdb mode only)

Create commands to be executed when the specified breakpoint is reached.

Syntax

```
commands breakpointnum
command_list
end
```

Parameters

breakpointnum	ID of a breakpoint. Default: Most recently-created breakpoint.
command_list	List of IDB commands, one command per line. If you do not include this parameter, the debugger removes an existing command list from the breakpoint.

Description

This command associates a list of debugger commands with the specified breakpoint. Whenever the breakpoint stops execution, the debugger executes these commands.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the **Console** window in the GUI.

To enter the list, write one command per line. End the list by typing a line that contains only the keyword `end`.

If the breakpoint already has a command list, this command list is overwritten by the new command list. You can enter an empty command list to remove a command list from a breakpoint.

Example

```
(idb) commands 4
Type commands for when breakpoint 4 is hit, one per line.
End with a line saying just "end".
>print "the value of i is"
>print i
>disable 4
>end
```

See Also

break (gdb mode only)
condition (gdb mode only)
disable
enable
info breakpoints (gdb mode only)

complete (gdb mode only)

List all the possible completions for the beginning of a command.

Syntax

```
complete string
```

Parameters

string	The beginning of the command to be completed.

Description

This command lists all the possible completions for the beginning of a command.

Example

```
(idb) complete p
path
print
p
printdbx
printf
ptype
pwd
```

See Also

help

condition (gdb mode only)

Specify a condition for a breakpoint.

Syntax

```
condition breakpointnum [condexpr]
```

Parameters

breakpointnum	ID of a breakpoint.
condexpr	Expression denoting a logical condition. If you do not specify this parameter, the debugger removes the condition from the breakpoint, and the breakpoint becomes an unconditional breakpoint.

Description

This command specifies a condition for breaking execution at a breakpoint.

When the specified breakpoint is encountered during execution, the debugger evaluates the specified expression. If the value of the expression is TRUE, the debugger stops executing the application. Otherwise, the debugger ignores the breakpoint.

See Also

break (gdb mode only)
commands (gdb mode only)
info breakpoints (gdb mode only)

cont (idb mode only)

Continue program execution.

Syntax

```
cont [in loc]
cont [signal] [to source_line]
n cont [signal]
```

Parameters

loc	A function name. Instructs the debugger to continue until it arrives at this function.
signal	An integer constant or a signal name. Default: 0
source_line	A line specifier.
n	The number of times to repeat the `cont` command.

Description

This command without a parameter continues program execution until the debugger encounters a breakpoint, a signal, an error, or normal process termination. Specify a *signal* parameter value to send an operating system signal to the process.

The *signal* parameter can be either a signal number or a string name, such as `SIGSEGV`. When you do not include this parameter, the process continues execution without specifying a signal. If you specify a *signal*, the process continues execution with that signal.

Use the `in` argument to continue until the debugger arrives at the function *loc*. The function name must be valid. If the function name is overloaded and you do not resolve the scope of the function in the command line, the debugger prompts you with the list of overloaded functions with that name from which to choose.

Use the `to` argument to resume execution and then halt when the debugger arrives at the source line *source_line*. The form of the optional `to` argument must be either:

- *quoted_filename*:*line_number*, which explicitly identifies both the source file and the line number where execution is to be halted.
- *line_number*, a positive numeral that indicates the line number of the current source file where execution is to be halted.

You can repeat the `cont` command *n* + 1 times by entering *n* `cont`.

Example

In the following example, a `cont` command resumes process execution after it is suspended by a breakpoint.

```
(idb) list 195:7
> 195 nodeList.append(new IntNode(3)); {static int somethingToReturnTo;
somethingToReturnTo++; }
196
197 IntNode* newNode2 = new IntNode(4);
198 nodeList.append(newNode2); {static int somethingToReturnTo;
somethingToReturnTo++; }
199
200 CompoundNode* cNode2 = new CompoundNode(10.123, 5);
201 nodeList.append(cNode2); {static int somethingToReturnTo;
somethingToReturnTo++; }
(idb) stop at 200
[#2: stop at "src/x_list.cxx":200]
(idb) cont
[2] stopped at [int main(void):200 0x0805197a]
200 CompoundNode* cNode2 = new CompoundNode(10.123, 5);
```

See Also

conti (idb mode only)
continue (gdb mode only)

conti (idb mode only)

Continue program execution until a specific address.

Syntax

```
conti to address
```

Parameters

address	The address until which program execution should run.

Description

This command continues program execution until the next instruction to be executed is at the specified address. Verify that the address specified is really the address of an instruction. Otherwise, the result of the continuation is unpredictable.

You can set a one-time breakpoint on an instruction address before continuing by entering `conti to address`.

See Also

cont (idb mode only)
continue (gdb mode only)
until (gdb mode only)

continue (gdb mode only)

Continue program execution.

Syntax

```
continue [number]
```

Parameters

number	The number of times to ignore a breakpoint at this location.

Description

This command continues program execution until the debugger encounters a breakpoint, a signal, an error, or normal process termination.

The *number* parameter specifies the number of times to subsequently ignore a breakpoint at this location.

Example

In the following example, a `continue` command resumes process execution after it is suspended by a breakpoint.

```
(idb) list 195,+7
195 nodeList.append(new IntNode(3)); {static int somethingToReturnTo;
somethingToReturnTo++; }
196
197 IntNode* newNode2 = new IntNode(4);
198 nodeList.append(newNode2); {static int somethingToReturnTo;
somethingToReturnTo++; }
199
200 CompoundNode* cNode2 = new CompoundNode(10.123, 5);
201 nodeList.append(cNode2); {static int somethingToReturnTo;
somethingToReturnTo++; }
(idb) break 200
Breakpoint 2 at 0x805197a: file src/x_list.cxx, line 200.
(idb) continue
Continuing.
Breakpoint 2, main () at src/x_list.cxx:200
200 CompoundNode* cNode2 = new CompoundNode(10.123, 5);
```

See Also

cont (idb mode only)
until (gdb mode only)

core-file (gdb mode only)

Specify a core file as a target, or specify not to use a core file.

Syntax

`core-file [filename]`

Parameters

filename	filename of the target core file.

Description

This command specifies a core file as a target or tells the debugger not to use a core file. Specify the file name of the core file to use it as a target.

This command without a *filename* parameter tells the debugger not to use a core file.

When you specify a core file, this command is the same as `target core`.

The debugger uses the core file as the contents of memory. Core files usually contain only some of the address space of the process that generated them. The debugger accesses the executable for the rest.

NOTE. The debugger ignores the core file when your program is actually running under the debugger. So if you have been running your program and you want to debug a core file instead, you must kill the subprocess in which the program is running, by using the `kill` command.

See Also

`kill`
`target core (gdb mode only)`

define (gdb mode only)

Create a user-defined command.

Syntax

`define [commandname]`

Parameters

commandname	Name of the command to create.

Description

This command creates a new command that you define.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the **Console** window in the GUI.

If a command with the name *commandname* already exists, the debugger prompts you to confirm the new definition.

The definition of a user-defined command may include:

- Commands.
- `if`, `while`, `loop_break`, and `loop_continue` commands.
- Up to 10 arguments separated by whitespace. Argument names are `$arg0`, `$arg1`, `$arg2`, ..., `$arg9`. The number of arguments is held in `$argc`.

To define a new command, enter `define` *commandname*, followed by each command on a separate line, and finally, enter `end`.

See Also

"User-defined Commands" in Chapter 5
`set max-user-call-depth (gdb mode only)`
`show max-user-call-depth (gdb mode only)`
`alias (idb mode only)`
`show user (gdb mode only)`

delete (idb mode only)

Delete all or specific breakpoints.

Syntax

```
delete { all | ID,… }
```

Parameters

ID	The ID of the breakpoint to be deleted

Description

This command deletes all breakpoints or the specified breakpoints.

Example

The following example deletes the breakpoints with the IDs 1 and 4.

```
(idb) delete 1,4
```

See Also

disable
enable
status (idb mode only)
stop every (idb mode only)
clear (gdb mode only)
delete breakpoint (gdb mode only)

delete breakpoint (gdb mode only)

Delete all or a specific breakpoint.

Syntax

```
delete breakpoint [ ID ]
```

Parameters

ID	The ID of the breakpoint to be deleted

Description

This command deletes all breakpoints if you do not specify an ID, or it deletes the specified breakpoint if you do.

Example

The following example deletes the breakpoints with the ID 4.

```
(idb) delete breakpoint 4
```

See Also

break (gdb mode only)
clear (gdb mode only)
delete (idb mode only)
disable
ignore (gdb mode only)
info breakpoints (gdb mode only)

delete display (gdb mode only)

Delete the specified items from the display list.

Syntax

```
delete display [ ID … ]
```

Parameters

ID	The ID of the item to remove from display list.

Description

This command deletes the specified items from the display list. If you do not specify *ID*, the debugger deletes the entire display list.

This command is equivalent to `undisplay`.

See Also

display (gdb mode only) Includes info on display lists.
disable display (gdb mode only)
enable display (gdb mode only)
info display (gdb mode only)
undisplay (gdb mode only)

delsharedobj (idb mode only)

Delete symbol information for a shared object.

Syntax

`delsharedobj` *`filename`*

Parameters

`filename`	File for which to remove the symbol information.

Description

This command deletes symbol table information for a shared object from the debugger when that information was previously loaded using a `readsharedobj` command.

See Also

`listobj (idb mode only)`
`readsharedobj (idb mode only)`

detach

Detach the debugger from a running process.

Syntax

GDB Mode:

```
detach
```

IDB Mode:

```
detach [pid,…]
```

Parameters

pid	IDB mode only. The process IDs of the processes from which to detach.

Description

This command detaches the debugger from all running processes. When you detach, the debugger removes all breakpoints.

If you attached to a process using the `attach` command, the process continues to run, but the debugger can no longer identify or control it.

IDB Mode:

By default, the detach command detaches the debugger from the current process and, therefore, does not require a process ID. To detach a non-current process, specify the process ID.

Example

GDB Mode:

```
(idb) detach
```

IDB Mode:

```
(idb) detach 12345, 789
```

See Also

attach
disconnect (gdb mode only)

directory (gdb mode only)

Add directories to the list of source directories.

Syntax

```
directory [directory_name1[:…]]
```

Parameters

directory_name	Name of the directory to be prepended to the list of source directories.

Description

This command deletes or adds directories to the list of source directories that the debugger uses to search for source and script files when opening an executable file.

The debugger maintains a list of source directories that it searches when opening an executable file.

To delete all directories in the list, use this command with no argument.

To add one directory to the beginning of the list, specify *directory_name*.

To add multiple directories to the beginning of the list, specify *directory_name* separated by a colon (:) or whitespace.

When you specify a directory already in the list, the debugger moves that directory one position up in the list.

To get the full list of directories in the search list, use the `show directories` command.

Example

```
(idb) directory
Source directories searched: $cdir:$cwd
(idb)
(idb) directory aa
Source directories searched: aa:$cdir:$cwd
(idb)
(idb) directory cc:dd
Source directories searched: cc:dd:aa:$cdir:$cwd
(idb)
(idb) directory ee:ff
```

```
Source directories searched: ee:ff:cc:dd:aa:$cdir:$cwd
(idb)
(idb) directory aa
Source directories searched: aa:ee:ff:cc:dd:$cdir:$cwd
```

See Also

"Specifying Source Directories" in Chapter 2
"Specifying Source Path Substitution Rules" in Chapter 2
idb directory (gdb mode only)
show directories (gdb mode only)
unuse (idb mode only)
use (idb mode only)

disable

Disable one or more breakpoints.

Syntax

GDB Mode:

`disable [`*`breakpointnum`*`,…]`

IDB Mode:

`disable { all | `*`breakpointnum`*`,… }`

Parameters

`breakpointnum`	The ID of a breakpoint.

Description

This command disables one or more breakpoints until you enable them.

When you set a breakpoint, it is enabled by default. When the debugger starts or resumes process execution, it first adapts the process so that it can detect when the specified events occur. You can disable a breakpoint so it does not interfere with determining when the process should next stop.

IDB Mode:

If you specify `all`, this command disables all currently existing breakpoints.

Example

```
(idb) disable 2,3
```

See Also

break (gdb mode only)
clear (gdb mode only)
delete (idb mode only)
enable
stop every (idb mode only)

disable display (gdb mode only)

Disable displaying the specified items.

Syntax

```
disable display [ ID … ]
```

Parameters

ID	The ID of the item to remove from display list.

Description

This command disables displaying the specified items in the display list. If you do not specify `ID`, the debugger disables the entire display list.

Example

```
(idb) enable display
(idb) step
No symbol "argv" in current context.
cannot evaluate argv
2: argv =
No symbol "argc" in current context.
cannot evaluate argc
1: argc =
(idb) disable display
(idb) step
(idb)
```

See Also

delete display (gdb mode only)
display (gdb mode only) Includes info on display lists.
enable display (gdb mode only)
info display (gdb mode only)
undisplay (gdb mode only)

disassemble (gdb mode only)

Disassemble and display machine instructions.

Syntax

```
disassemble [address] |[address1 address2]
```

Parameters

address	A program counter value. The debugger dumps the function around this value.
address1 address2	A range of addresses to dump. *address1* is inclusive, *address2* is exclusive.

Description

This command displays a range of memory as machine instructions.

To display the memory range of the function surrounding the selected frame's program counter, use this command with no arguments.

To display the memory range of the function surrounding a specific program counter value, specify *address*.

To display a range of addresses, specify the first address in the range, *address1*, and the address immediately following the range, *address2*. Notice that *address2* is not included in the range.

disconnect (gdb mode only)

Disconnect from all running processes and remove all breakpoints.

Syntax

```
disconnect
```

Parameters

None.

Description

This command detaches the debugger from all running processes. When you detach, the debugger removes all breakpoints.

If you attached to a process using the `attach` command, the process continues to run, but the debugger can no longer identify or control it.

Example

```
(idb) disconnect
```

See Also

attach
detach

display (gdb mode only)

Add the specified item to the display list.

Syntax

```
display[/format] { expr | addr }
```

Parameters

format	The output format. Use one of the following values x Regard the bits of the value as an integer, and print the integer in hexadecimal d Print as integer in signed decimal. u Print as integer in unsigned decimal. o Print as integer in octal. t Print as integer in binary. The letter t stands for *two*. a Print as an address, both absolute in hexadecimal and as an offset from the nearest preceding symbol. c Regard as an integer and print it as a character constant. f Regard the bits of the value as a floating point number and print using typical floating point syntax. i instruction s string
expr	Expression to display
addr	Address to display

Description

This command adds the expression *expr* or the address *addr* to the display list.

The debugger includes an automatic display list, which prints the value of an expression each time the debuggee stops.

Each expression or address in the list has an ID. Each line of the list displays the ID, the expression, and the current value of the expression. For example:

```
5: foo = 28
6: bar[5] = (struct mystruct *) 0x1234
```

You can specify the output format for the value of the expression. The debugger uses the same output formats as defined in the `print` and `x` commands.

See Also

delete display (gdb mode only)
disable display (gdb mode only)
enable display (gdb mode only)
info display (gdb mode only)
print
undisplay (gdb mode only)
x (gdb mode only)

down

Move a number of frames down the stack and print them.

Syntax

```
down [ num ]
```

Parameters

num	A non-negative numeric expression.

Description

This command moves to the stack frame *num* levels below the current frame. The default value for num is 1.

If the specified number of levels exceeds the number of active calls on the stack in the specified direction, the debugger issues a warning message and the call frame does not change.

When the current call frame changes, the debugger displays the source line corresponding to the last instruction executed in the function executing the selected call frame.

Use the down command without an expression to change to the call frame located one level down the stack. Specify an expression that evaluates to an integer to change the call frame down the specified number of levels.

IDB Mode:

When large and complex values are passed by value to a routine on the stack, the output of the down command can be voluminous. You can set the control variable $stackargs to 0 to suppress the output of argument values in the down commands.

Example

```
(idb) down 1
#1  0x0804af73 in List<Node>::print (this=0xbfffa330) at
src/x_list.cxx:168
168         currentNode->printNodeData();
```

See Also

down-silently (gdb mode only)
up
up-silently (gdb mode only)
"$stackargs" in Chapter 8

down-silently (gdb mode only)

Move a number of frames down the stack but do not print them.

Syntax

```
down-silently [ num ]
```

Parameters

num	A non-negative numeric expression.

Description

This command moves to the stack frame *num* levels below the current frame. The default value for num is 1. This command is the same as down, except that it does not display the new frame.

If the specified number of levels exceeds the number of active calls on the stack in the specified direction, the debugger issues a warning message and the call frame does not change.

See Also

down
up
up-silently (gdb mode only)

dump (idb mode only)

List the parameters and local variables on the stack.

Syntax

```
dump [ {funcname|.} ]
```

Parameters

funcname	Name of an active function in the debuggee.

Description

This command lists all parameters and local variables of the specified function. If you specify a period (.), the debugger lists all parameters and local variables of all active functions (all functions currently on the stack). If you specify no argument, the debugger assumes the current function.

Example

```
(idb) dump
>0 0x08051a3c in main() "src/x_list.cxx":203
cNode=0x805c510
cNode1=0x805c528
cNode2=0x805c560
newNode=0x805c500
newNode2=0x805c550
nodeList=class List<Node> { ... }
```

See Also

info locals (gdb mode only)

echo (gdb mode only)

Print a string.

Syntax

`echo` *`string`*

Parameters

`string`	The string to print.

Description

This command prints an expression.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the **Console** window in the GUI.

You can include nonprinting characters in the string using C escape sequences such as `\n` to print a newline.

The debugger does not print a newline unless you specify one.

To specify a space, use a backslash (`\`) followed by a space, which you may find useful, because the debugger removes all leading and trailing spaces from all arguments. For example, to print the string ‘ `or foo =` ’, enter the following:

```
(idb) echo \ or foo = \
```

In command line mode, but not in the Console window of the GUI, as in C, you can use a backslash at the end of text to continue the command onto subsequent lines. For example:

```
echo This text\n\
occupies\n\
multiple lines.\n
```

produces the same output as

```
echo This text\n
echo occupies\n
echo multiple lines.\n
```

edit (idb mode only)

Edit the current source file or a specified file.

Syntax

```
edit [filename]
```

Parameters

filename	The name of the file to edit.

Description

This command invokes the editor defined by the `EDITOR` environment variable.

The debugger passes the editor the file name to edit using *filename*. If you do not specify *filename*, the editor opens the current file. If no current file exists, the editor opens without a file.

If the `EDITOR` environment variable is undefined, the debugger invokes the `vi` editor.

Example

The following example opens the file `chars.c` in the Emacs* editor:

```
(idb) sh printenv EDITOR
emacs
(idb) file
chars.c
(idb) edit
```

The following example opens the file `~/foo/bar.f` in the `nedit` editor:

```
(idb) sh printenv EDITOR
nedit
(idb) edit ~/foo/bar.f
```

See Also

file (idb mode only)
sh (idb mode only)

enable

Enable one or more breakpoints.

Syntax

GDB Mode:

`enable [`*`breakpointnum`*`,…]`

IDB Mode:

`enable { all | `*`breakpointnum`*`,… }`

Parameters

`breakpointnum`	The ID of a breakpoint.

Description

This command enables one or more breakpoints until you disable them.

When you set a breakpoint, it is enabled by default. When the debugger starts or resumes process execution, it first adapts the process so that it can detect when the specified events occur. You can disable a breakpoint so that it is does not interfere with determining when the process should next stop.

IDB Mode:

If you specify `all`, this command enables all currently existing breakpoints.

Example

```
(idb) enable 2,3
```

See Also

break (gdb mode only)
clear (gdb mode only)
delete (idb mode only)
disable
stop every (idb mode only)

enable display (gdb mode only)

Enable displaying the specified items.

Syntax

```
enable display [ ID … ]
```

Parameters

ID	The ID of the item to remove from display list.

Description

This command enables displaying the specified items in the display list. If you do not specify `ID`, the debugger enables the entire display list.

Example

```
(idb) enable display
(idb) step
No symbol "argv" in current context.
cannot evaluate argv
2: argv =
No symbol "argc" in current context.
cannot evaluate argc
1: argc =
(idb) disable display
(idb) step
(idb)
```

See Also

delete display (gdb mode only)
display (gdb mode only) Includes info on display lists.
disable display (gdb mode only)
info display (gdb mode only)
undisplay (gdb mode only)

exit (idb mode only)

Exit the debugger.

Syntax

`exit [exit_status]`

Parameters

exit_status	An expression for the exit status.

Description

This command exits the debugger. This command is equivalent to `quit`.

See Also

`quit`

expand aggregated message (idb mode only)

Expand the specified or most recent message.

Syntax

```
expand aggregated message [msg,…]
```

Parameters

msg	A message ID. Default: `0`.

Description

This command expands the specified messages. If you do not specify a message ID, the debugger expands the most recently added message.

This command is useful when debugging parallel applications.

The root debugger collects the outputs from the leaf debuggers and presents you with an aggregated output. In most cases, this aggregation works fine, but it can be an impediment if you want to know the exact output from certain leaf debuggers. To remedy this, the debugger assigns a unique message ID number to each aggregated message and saves the message in the message list.

You can control the length of the message list using the `$aggregatedmsghistory` debugger variable. If you set this variable to the default, 0, the debugger records as many messages as the system will allow.

See Also

`show aggregated message`
"`$aggregatedmsghistory`" in Chapter 8

export (idb mode only)

Set an environment variable or print all variables.

Syntax

```
export [varname [ = value]]
```

Parameters

varname	Name of the variable to be set or printed.
value	The value to assign to the variable.

Description

This command sets an environment variable or prints all variables. The `export` and `setenv` commands without any variables are equivalent.

`setenv` is similar to `export`, except that `export` requires the equal sign to set a value, while `setenv` does not.

See Also

printenv (idb mode only)
setenv (idb mode only)
set environment (gdb mode only)

file (gdb mode only)

Load an executable file for debugging, or unload.

Syntax

```
file [filename]
```

Parameters

filename	The executable for the debugger to load.

Description

This command specifies an executable file to execute under debugger control.

This command reads the symbolic information for an executable file and the shared libraries it uses, if available. Objects compiled without debug information do not have symbols to load.

If you specify *filename*, the debugger loads the specified executable. Without an argument, the debugger unloads the current executable file.

Example

```
(idb) file /home/user/examples/x_list
Reading symbols from /home/user/examples/x_list...done.
(idb) info files
Symbols from "/home/user/examples/x_list".
Unix child process:
Using the running image of child process 19438.
While running this, IDB does not access memory from...
Local exec file:
'/home/user/examples/x_list', file type <unknown>
0x8048000 - 0x8056e40 is .text
0x8057000 - 0x805deec is .data
0x805deec - 0x805dfb4 is .bss
```

Use the `file` command without an argument to unload an executable file, as follows:

```
(idb) info files
Symbols from "/home/user/examples/x_list"".
Unix child process:
```

```
Using the running image of child process 17560.
While running this, IDB does not access memory from...
Local exec file:
'/home/user/examples/test/idb/Examples/exp/i686-Linux-currstable/debugga
ble/x_list', file type <unknown>
0x8048000 - 0x80555d0 is .text
0x8056000 - 0x805be08 is .data
0x805be08 - 0x805bec0 is .bss
(idb) file
No executable file now.
No symbol file now.
(idb) info files
```

See Also

load (idb mode only)

file (idb mode only)

Switch to the specified source file.

Syntax

```
file [filename]
```

Parameters

filename	The name of the file for which you want to set the scope.

Description

This command displays the name of the current file scope, or switches the file scope. Change the file scope to see source code for or to set a breakpoint in a function not in the file currently being executed.

To display the name of the current file scope, do not include *filename*.

To change the name of the current file scope, include *filename*.

If the file name is not a literal, use the `fileexpr` command. For example, if you have a script that calculates a file name in a debugger variable or in a routine that returns a file name as a string, you can use `fileexpr` to set the file.

Example

The following example uses the `file` command to set the debugger file scope to a file different from the main program, and then stops at line number 26 in that file. This example also shows the `fileexpr` command setting the current scope back to the original file, which is `solarSystem.cxx`.

```
(idb) run
[1] stopped at [int main(void):114 0x080569f8]
114 unsigned int j = 1; // for scoping examples
(idb) file
/home/user/examples/solarSystemSrc/main/solarSystem.cxx
(idb) set $originalFile = "solarSystem.cxx"
(idb) list 36:10
36 Moon *enceladus = new Moon("Enceladus", 238, 260, saturn);
37 Moon *tethys = new Moon("Tethys", 295, 530, saturn);
38 Moon *dione = new Moon("Dione", 377, 560, saturn);
39 Moon *rhea = new Moon("Rhea", 527, 765, saturn);
```

```
40 Moon *titan = new Moon("Titan", 1222, 2575, saturn);
41 Moon *hyperion = new Moon("Hyperion", 1481, 143, saturn);
42 Moon *iapetus = new Moon("Iapetus", 3561, 730, saturn);
43
44 Planet *uranus = new Planet("Uranus", 2870990, sun);
45 Moon *miranda = new Moon("Miranda", 130, 236, uranus);
(idb) file star.cxx
(idb) list 36:10
36 void Star::printBody(unsigned int i) const
37 {
38 std::cout << "(" << i << ") Star [" << name()
39 << "], class [" << stellarClassName(classification())
40 << ((int)subclassification()) << "]" << std::endl;
41 }
42
43 StellarClass Star::classification() const
44 {
45 return _classification;
(idb) stop at 38
[#2: stop at "/home/user/examples/solarSystemSrc/star.cxx":38]
(idb) cont
[2] stopped at [virtual void Star::printBody(unsigned int) const:38
0x08054526]
38 std::cout << "(" << i << ") Star [" << name()
(idb) file
/home/user/examples/solarSystemSrc/main/solarSystem.cxx
(idb) fileexpr $originalFile
(idb) file
/home/user/examples/solarSystemSrc/main/solarSystem.cxx
(idb) list 36:10
36 Moon *enceladus = new Moon("Enceladus", 238, 260, saturn);
37 Moon *tethys = new Moon("Tethys", 295, 530, saturn);
38 Moon *dione = new Moon("Dione", 377, 560, saturn);
```

```
39 Moon *rhea = new Moon("Rhea", 527, 765, saturn);
40 Moon *titan = new Moon("Titan", 1222, 2575, saturn);
41 Moon *hyperion = new Moon("Hyperion", 1481, 143, saturn);
42 Moon *iapetus = new Moon("Iapetus", 3561, 730, saturn);
43
44 Planet *uranus = new Planet("Uranus", 2870990, sun);
45 Moon *miranda = new Moon("Miranda", 130, 236, uranus);
```

See Also

fileexpr (idb mode only)
info files (gdb mode only)
list

fileexpr (idb mode only)

Switch to the specified source file.

Syntax

`fileexpr [`*`expression`*`]`

Parameters

`expression`	The name of the file to which you want to switch.

Description

This command is similar to `file`, but instead of specifying a literal file name, you can specify an expression. For example, if you have a script that calculates a file name in a debugger variable or in a routine that returns a file name as a string, you can use `fileexpr` to set the file.

See Also

`file (idb mode only)`
`info files (gdb mode only)`
`list`

finish (gdb mode only)

Continue execution until the current function returns.

Syntax

```
finish
```

Parameters

None.

Description

This command continues execution of the current function until it returns to its caller.

This command finishes the `append` method and returns control to the caller.

The `finish` command is sensitive to your location in the call stack. Suppose function A calls function B, which calls function C. Execution has stopped in function C, and you enter the up command, so you are now in function B, at the point where it called function C. Using the `finish` command here returns you to function A, at the point where function A called function B. Functions B and C have completed execution.

Example

```
(idb) continue
Continuing.
Breakpoint 1, List<Node>::append (this=0xbfffcbe0, node=0x805c540) at
src/x_list.cxx:151
151 Node* currentNode = _firstNode;
(idb) finish
main () at src/x_list.cxx:195
195 nodeList.append(new IntNode(3)); {static int somethingToReturnTo;
somethingToReturnTo++; }
```

See Also

return (idb mode only)
run

focus (idb mode only)

Change or display the current process set.

Syntax

```
focus [ {expr|all} ]
```

Parameters

expr	The expression of the set to which you want to change.
all	Sets the current set to the set that includes all processes.

Description

This command changes the current process set, which is the set of processes whose debuggers receive the remote command entered at the root debugger.

To display the current process set, do not enter any parameters.

To change the process set to another set, specify the process set in *expr*.

To change the process set to the set that includes all processes, use the `all` parameter.

See Also

"Working With Thread and Process Sets" in Chapter 6

forward-search (gdb mode only)

Search forward in the source for a string or repeat last search.

Syntax

```
forward-search [string]
```

Parameters

string	The character string to search for.

Description

This command searches forward, starting at the current position, in the current source file for the specified character string. If you do not specify *string*, the debugger uses the string of the most recent search.

The debugger interprets the rest of the line to be the search string, so you do not need to quote the string. The debugger executes alias expansion on whatever precedes this command on the same line, possibly changing the search string.

When the debugger finds a match, it lists the line number and the line. That line becomes the starting point for any further searches, or for a `list` command.

Example

```
(idb) forward-search _firstNode
69 NODETYPE* _firstNode;
```

See Also

reverse-search (gdb mode only)
search (gdb mode only)

frame (gdb mode only)

Show or change the current function scope.

Syntax

`frame [expr]`

Parameters

expr	The frame to use as the starting point.

Description

This command shows or changes the current function scope.

The *expr* parameter can be a frame number or an address. Frame zero is the frame that is currently executing, frame one called frame zero, and so on. The frame with the highest number is for `main`.

You may find it useful to specify an address if a bug has damaged the stack frame chaining, making it impossible for the debugger to properly assign numbers to frames. You may also find it useful when your application switches between multiple stacks.

See Also

`func (idb mode only)`
`down`
`up`

func (idb mode only)

Show or change the current function scope.

Syntax

```
func [func_name | num ]
```

Parameters

func_name	The name of the function to which you want to change the function scope.
num	An integer, the debugger moves to the frame at level *n*.

Description

This command shows or changes the current frame.

To change the current frame to the call frame of a function in the call stack, specify the name of that function with *func_name*. If the function occurs more than once in the call stack, the most-recently entered call frame for that function becomes the current call frame.

To display the name of the current call frame's function, use the `func` command without an *expr*.

To return to the current function scope, which is the default, use the command `func 0`.

If no frames are available to select, the debugger context is set to the static context of the named function. The current scope and current language are set based on that function. Types and static variables local to that function are now visible and can be evaluated.

To move the debugger to a specific frame level, specify that level with *num*. This is equivalent to entering `up` *n* at the level 0 function.

See Also

class (idb mode only)
down
up
frame (gdb mode only)

goto (idb mode only)

Skip to a specific line number.

Syntax

```
goto line_number
```

Parameters

line_number	The line number at which you want to resume execution.

Description

This command skips over the execution of a portion of source code to a specific line number.

Use this command with care or not at all.

Even if the code was compiled without optimization, the compiler may have reused registers and moved instructions such that source lines and actual instructions do not completely match up. So skipping instructions with this command may not lead to the result that you expect based on the idea that the debugger is skipping lines.

See Also

jump (gdb mode only)

handle (gdb mode only)

Set signal handling actions.

Syntax

`handle` *`signal_name handle_keyword`*

Parameters

`signal_name` The name of the signal to handle.

`handle_keyword` The action to take on the signal. Must be one of the following:

- `stop`. The debugger should stop your program when this signal occurs. This implies the `print` keyword as well.
- `nostop`. The debugger should not stop your program when this signal occurs. It may still print a message telling you that the signal has come in.
- `print`. The debugger should print a message when this signal occurs.
- `noprint`. The debugger should not mention the occurrence of the signal at all. This implies the `nostop` keyword as well.
- `pass`. The debugger should allow your program to see this signal. Your program can handle the signal, or else it may terminate if the signal is fatal and not handled. `pass` and `noignore` are synonyms.
- `nopass`. The debugger should not allow your program to see this signal. `nopass` and `ignore` are synonyms.
- `ignore`. The debugger should not allow your program to see this signal. `nopass` and `ignore` are synonyms.
- `noignore`. The debugger should allow your program to see this signal; your program can handle the signal, or else it may terminate if the signal is fatal and not handled. `pass` and `noignore` are synonyms.

Description

This command defines how the debugger handles signals.

This command is not supported for Windows* OS targets.

The debugger can detect any occurrence of a signal in your program. You can define in advance how the debugger should handle each kind of signal. Normally, the debugger is set up to let some signals like SIGUSR1 be silently passed to the debuggee, but to stop your program immediately whenever an error signal happens. This command changes these settings.

Example

```
(idb) info handle ILL
Unrecognized or ambiguous flag word: "ILL".
(idb) handle SIGILL nostop noprint
Signal        Stop      Print   Pass to program Description
SIGILL        No        No      No              Illegal instruction
```

See Also

info handle (gdb mode only)
info signals (gdb mode only)

help

Display help for debugger commands.

Syntax

GDB Mode:

`help [ topic ]`

`h [ topic ]`

IDB Mode:

`help [ topic | idb | command ]`

Parameters

topic	**GDB Mode:** A command or a class of commands. **IDB Mode:** The command or topic for which you want to view help.
idb	**IDB Mode:** Displays a list of command classes.
command	**IDB Mode:** Lists all available debugger commands.

Description

GDB Mode:

This command displays a list of command classes, or help for specific commands or classes of commands.

To see a list of command classes, do not include any parameters.

To see a list of commands in a specific class, specify a command class for *topic*.

To see help for a specific command, specify a command for *topic*.

To list all arguments for a command, use the `complete` command.

IDB Mode:

This command displays a list of help topics, help for a topic, or help for a specific command.

To see a list of help topics, do not include any parameters. The debugger displays all available topics and describes how to access them.

To see help for a specific topic, specify a topic for *topic*.

To see a list of available debugger commands, enter `help command`.

To see help for a specific command, specify a command for *topic*.

To see a list of function-oriented debugger commands, enter `help idb`.

See Also

`complete (gdb mode only)`

history (idb mode only)

Show the most recently used debugger commands.

Syntax

```
history [num]
```

Parameters

num	The number of commands to show, starting with the most recent.

Description

This command displays commands you have already entered.

To specify the number of commands to show, use the *num* parameter. The debugger displays that number of commands, starting with the most recent.

If you do not specify a number, the debugger displays the number of previous commands defined in the `$historylines` debugger variable. The default is 20.

Example

```
(idb) history 7
18: stop at 182
19: run
20: stop at 103
21: delete 1
22: cont
23: print "history_EXAMPLE START"
24: history 7
```

See Also

"Viewing the Command History" in Chapter 5
set history save
set history size

idb directory (gdb mode only)

Add a directory to the list of source directories or reset the list.

Syntax

```
idb directory [ directory ]
```

Parameters

directory	A single directory to be added to the list of source directories.

Description

This command is similar to the `directory` command. It differs in that:

- it does not ask for confirmation when resetting the list of source directories back to the default
- it only accepts a single *directory* parameter

Example

```
idb directory
idb directory foo/bar
```

See Also

directory (gdb mode only)

idb freeze (gdb mode only)

Set the execution attribute of the specified threads to `frozen`.

Syntax

```
idb freeze [thread_set]
```

Parameters

thread_set	A thread set.

Description

This command sets the execution attribute of the specified threads to `frozen`. If you do not specify any threads, the debugger uses the current thread.

A frozen thread does not resume when you resume executing a set of threads in the job.

See Also

idb info thread (gdb mode only)
idb thaw (gdb mode only)
idb uninterrupt (gdb mode only)
"Working With Thread and Process Sets: Overview" in Chapter 6

idb info barrier (gdb mode only)

Shows information for existing barriers in an OpenMP application.

Syntax

```
idb info barrier [ barrier_id, ... ]
```

Parameters

barrier_id	A barrier ID.

Description

An OpenMP barrier defines a point in an application that every thread of a particular team has to reach before thread execution continues.

This command displays the following information for any existing barriers, which you specify with *barrier_id*, in an OpenMP application:

- state
- the threads that reached the barrier
- the barrier's location
- a list of tasks the barrier is waiting for
- the source code that created the current barrier

If you do not specify *barrier_id*, this command shows all existing barriers in the OpenMP application.

NOTE. This command is fully supported for OpenMP versions 3.0 and higher. For older versions, this command has restricted functionality.

See Also

idb info lock (gdb mode only)
idb info openmp thread tree (gdb mode only)
idb info task (gdb mode only)
idb info taskwait (gdb mode only)
idb info team (gdb mode only)
idb info thread (gdb mode only)

idb info lock (gdb mode only)

Shows information for existing locks in an OpenMP application.

Syntax

```
idb info lock [ lock_id, ... ]
```

Parameters

lock_id	A lock ID.

Description

The OpenMP runtime library contains various lock routines that you can use for synchronization.

This command displays the following information for any existing locks, which you specify with *lock_id*, in an OpenMP application:

- state
- type
- the tasks or threads holding references to the lock
- The tasks or threads that are waiting for the lock
- the lock's location
- the source code that created the current lock

If you do not specify *lock_id*, this command shows all existing locks in the OpenMP application.

NOTE. This command is fully supported for OpenMP versions 3.0 and higher. For older versions, this command has restricted functionality.

See Also

idb info barrier (gdb mode only)
idb info openmp thread tree (gdb mode only)
idb info task (gdb mode only)
idb info taskwait (gdb mode only)
idb info team (gdb mode only)
idb info thread (gdb mode only)

idb info openmp thread tree (gdb mode only)

Display the threads in the process in a tree format.

Syntax

```
idb info openmp thread tree
```

Parameters

None.

Description

This command displays the parent-child relationship among OpenMP tasks in a tree format. Each internal node in the tree is a task that has spawned other tasks. Tasks that have not spawned other tasks are displayed as leafnodes.

This command only displays current tasks and task teams, not destroyed tasks or task teams.

NOTE. This command is fully supported for OpenMP versions 3.0 and higher. For older versions, this command has restricted functionality.

See Also

idb info barrier (gdb mode only)
idb info lock (gdb mode only)
idb info task (gdb mode only)
idb info taskwait (gdb mode only)
idb info team (gdb mode only)
idb info thread (gdb mode only)

idb info task (gdb mode only)

Display information for existing tasks in an OpenMP application.

Syntax

```
idb info task [ task_id, ... ]
```

Parameters

task_id	A task ID.

Description

This command displays the following information for any existing task, which you specify with *task_id*, in an OpenMP application.

- type
- state
- the thread executing the task
- the parent task
- the spawned tasks
- a task's location
- the source code that created the current lock

If you do not specify *task_id*, this command shows all existing tasks in the OpenMP application.

NOTE. This command is fully supported for OpenMP versions 3.0 and higher. For older versions, this command has restricted functionality.

See Also

idb info barrier (gdb mode only)
idb info lock (gdb mode only)
idb info openmp thread tree (gdb mode only)
idb info taskwait (gdb mode only)
idb info team (gdb mode only)
idb info thread (gdb mode only)

idb info taskwait (gdb mode only)

Display information for any existing taskwait.

Syntax

```
idb info taskwait [ taskwait_id, ... ]
```

Parameters

taskwait_id	A taskwait ID.

Description

An OpenMP taskwait is a specific task barrier. It defines a point in an application that all tasks generated by the current task or thread have to reach before thread execution continues.

This command displays the following information for any existing taskwait, which you specify with *taskwait_id*, in an OpenMP application.

- state
- the number of tasks the taskwait is waiting for
- the taskwait's location
- other internal OpenMP information

If you do not specify *taskwait_id*, this command shows all existing tasks in the OpenMP application.

NOTE. This command is fully supported for OpenMP versions 3.0 and higher. For older versions, this command has restricted functionality.

See Also

idb info barrier (gdb mode only)
idb info lock (gdb mode only)
idb info openmp thread tree (gdb mode only)
idb info task (gdb mode only)
idb info team (gdb mode only)
idb info thread (gdb mode only)

idb info team (gdb mode only)

Display information for any existing team.

Syntax

```
idb info team [ team_id, ... ]
```

Parameters

team_id	A team ID.

Description

An OpenMP team is a set of one or more threads that are members of a parallel region.

This command displays the following information for any existing teams, which you specify with *team_id*, in an OpenMP application:

- the parent team
- the number of threads in a team
- the team's location

If you do not specify *team_id*, this command shows all existing teams in the OpenMP application.

See Also

idb info barrier (gdb mode only)
idb info lock (gdb mode only)
idb info openmp thread tree (gdb mode only)
idb info task (gdb mode only)
idb info taskwait (gdb mode only)
idb info thread (gdb mode only)

idb info thread (gdb mode only)

Show the specified threads in the process.

Syntax

```
idb info thread [ thread_id, ... ]
```

Parameters

thread_id	The ID of a thread.

Description

This command shows the following information for any threads you specify with *thread_id*:

- type
  - **native**
    A thread that the operating system created.
  - **unknown**
    In an OpenMP* process, the OpenMP* runtime library cannot determine the type of the thread.
  - **initial**
    In an OpenMP* process, the first thread in the process.
  - **omp**
    A thread that is created by the OpenMP runtime library.
  - **foreign**
    In an OpenMP* process, a thread that is not created by the OpenMP runtime library, such as the result of the application directly calling the thread creation function that the system thread library provided.
  - **monitoring**
    A thread that the OpenMP RTL created to monitor the execution of the OpenMP threads in the process.
- the ID numbers of the OS threads.
- the ID number of the thread library.
- the execution attribute of the thread:

  - **frozen**

    The thread does not resume when you resume executing a set of threads in the job.

  - **thawed**

    The thread resumes when you resume executing a set of threads in the job.

  - **uninterrupted**

    The thread continues running without being interrupted for events. It basically detaches the thread from the debugger's control.

- the current thread location.

If you do not specify *thread_id*, this command shows all existing threads.

See Also

idb info barrier (gdb mode only)
idb info lock (gdb mode only)
idb info openmp thread tree (gdb mode only)
idb info task (gdb mode only)
idb info taskwait (gdb mode only)
idb info team (gdb mode only)

idb process (gdb mode only)

Show or specify a process.

Syntax

```
idb process [ pid-expression | image-name ]
```

Parameters

pid-expression

image-name The number of commands to show, starting with the most recent.

Description

This command shows or specifies a process using the process ID number or the name of the image.

If you do not specify any parameters, the debugger shows the current process.

The debugger sets the context of the current process to the process ID, *pid-expression*, or the process that runs the named binary image, *image-name*. If there is more than one process running the same binary image, the debugger warns you and leaves the process context unchanged.

Example

```
(idb) idb process
There is no current process.
You may start one by using the `file' or `attach' commands.
(idb) file ~/c_code/hello
Reading symbols from /home/hal/hello...done.
(idb) idb process
>localhost:6121 (/home/hal/hello) loaded.
```

idb session restore (gdb mode only)

Load a session file to restore a session's debug settings.

Syntax

```
idb session restore session_file
```

Parameters

session_file	The name of the session file. If you include a relative path, the path is relative to `$sessiondir`. Default: `idb_customizations.cmd`

Description

This command loads a session file to restore a session's debug settings.

If *session_file* includes an absolute path, the debugger does not use `$sessiondir`.

NOTE. It is recommended that only experienced users use relative paths. Unless you have a specific reason to do otherwise, you should only provide a file name and not a path.

Example

The following example loads the session file `$sessiondir/lastsession.my`.

```
(idb) idb session restore lastsession.my
```

The following example loads the session file `$sessiondir/../test`.

```
(idb) idb session restore ../test
```

The following example uses an absolute path to load the session file `/tmp/test.my`.

```
(idb) idb session restore /tmp/test.my
```

See Also

"About Session Handling" in Chapter 4
"Restoring a Session" in Chapter 4
"About Session Handling in Command-line Mode" in Chapter 4
idb session save (gdb mode only)

idb session save (gdb mode only)

Save a session's debug settings to a file.

Syntax

```
idb session save [ session_file ]
```

Parameters

session_file	The name of the session file. If you include a relative path, the path is relative to `$sessiondir`. Default: `idb_customizations.cmd`

Description

This command saves a session's debug settings to a file.

If *session_file* includes an absolute path, the debugger does not use `$sessiondir`.

NOTE. It is recommended that only experienced users use relative paths. Unless you have a specific reason to do otherwise, you should only provide a file name and not a path.

Example

The following example saves the session to `$sessiondir/lastsession.my`.

```
(idb) idb session save lastsession.my
```

The following example saves the session to `$sessiondir/../test`.

```
(idb) idb session save ../test
```

The following example uses an absolute path to save the session to `/tmp/test.my`.

```
(idb) idb session save /tmp/test.my
```

See Also

idb session restore (gdb mode only)

idb set openmp-serialization (gdb mode only)

Enable or disable serial execution of parallel regions in an OpenMP* process.

Syntax

```
idb set openmp-serialization [on | off]
```

Parameters

`on`	Enable serial execution. This is the default value.
`off`	Disable serial execution.

Description

This command does not apply to Mac OS*

This command enables or disables serial execution of parallel regions in an OpenMP* process.

See Also

idb show openmp-serialization (gdb mode only)

idb set solib-path-substitute (gdb mode only)

Substitute a directory path when loading shared libraries.

Syntax

```
idb set solib-path-substitute dir_path replacement_dir_path
```

Parameters

dir_path	The shared library directory path specified in the debuggee.
replacement_dir_path	The directory that replaces *dir_path*.

Description

This command is only available when debugging a remote target.

This command replaces a directory path that is specified in the debuggee's binary when loading shared libraries.

Use this command if you want the debugger to search for shared libraries in a non-standard location.

Example

The following command defines the local copy of the main image:

```
(idb) file ~/src/foo.exe
```

The following command defines the actual binary to run:

```
(idb) idb file-remote /usr/tmp/foo.exe
```

The following command tells the debugger that when the actual target is in `/usr/lib/foo.so`, the load-path specified in the binary, it should look in `/tmp/shlib/foo.so`:

```
(idb) idb set solib-path-substitute /usr/lib /tmp/shlib
```

See Also

idb show solib-path-substitute (gdb mode only)
idb unset solib-path-substitute (gdb mode only)

idb show openmp-serialization (gdb mode only)

Show if serialization of parrallel regions in an OpenMP process is enabled.

Syntax

```
idb show openmp-serialization
```

Parameters

None.

Description

This command does not apply to Mac OS*

This command shows if serialization of parrallel regions in an OpenMP process is enabled.

See Also

idb set openmp-serialization (gdb mode only)

idb show solib-path-substitute (gdb mode only)

Show the replacement directory for loading shared libraries.

Syntax

```
idb show solib-path-substitute [ dir_path ]
```

Parameters

dir_path	The shared library directory path specified in the debuggee.

Description

This command shows the replacement directory path for the specified path in the target that the debugger uses to load shared libraries.

If you do not specify *dir_path*, the debugger shows all replacement directories.

Example

```
(idb) idb set solib-path-substitute /usr/lib /tmp/shlib
(idb) idb set solib-path-substitute /usr/hal/lib /tmp/hal/shlib
(idb) idb show solib-path-substitute
/usr/lib => /tmp/shlib
/usr/hal/lib => /tmp/hal/shlib
```

See Also

idb set openmp-serialization (gdb mode only)
idb unset solib-path-substitute (gdb mode only)

idb stopping threads (gdb mode only)

Specify the threads that stop when a breakpoint is hit.

Syntax

```
idb stopping threads breakpoint_id [ thread_set ]
```

Parameters

breakpoint_id	The ID of the breakpoint whose stopping threads you want to specify.
thread_set	A thread set. If you do not specify this parameter, all threads are stopping threads.

Description

This command specifies the threads that stop when a breakpoint is hit.

Execution stops in all of the threads you specify when the breakpoint is triggered.

To specify stopping threads, use thread set notation.

See Also

info threads (gdb mode only)
Process and Thread Set Notation

idb synchronize (gdb mode only)

Set a thread syncpoint at a location you specify.

Syntax

```
idb synchronize {func | line | *addr}, thread_set [if cond]
```

Parameters

func	The name of a function.
line	A line number in a source code file.
addr	An address.
thread_set	A thread set.
cond	A conditional expression. Execution stops when the debugger hits the specified location and this condition evaluates to TRUE.

Description

This command sets a thread syncpoint.

A syncpoint is an address in code. When a thread you want to synchronize reaches the syncpoint, the debugger stops that thread and freezes it. The syncpoint is hit when all the threads being synchronized have reached the syncpoint. The debugger thaws the threads being synchronized after the hit.

Syncpoints and breakpoints have the same attributes, except that when defining a breakpoint, you can optionally specify the threads that trigger it, whereas with a syncpoint, you specify the threads you want to synchronize.

When you specify *cond*, the debugger evaluates the condition every time a synchronized thread arrives at the syncpoint, in the context of that thread.

The eventing thread of a syncpoint is the thread that arrives last at the syncpoint.

See Also

"Working With Thread and Process Sets: Overview" in Chapter 6
clear (gdb mode only)
delete breakpoint (gdb mode only)
disable
enable
ignore (gdb mode only)
info breakpoints (gdb mode only)

idb target threads (gdb mode only)

Specify the threads that subsequent mover commands apply to.

Syntax

```
idb target threads target_thread_set [ only ]
```

Parameters

target_thread_set A thread set.

Description

This command specifies the threads that subsequent mover commands apply to. Mover commands are commands that advance the application, such as `step` or `continue`.

If you specify the keyword `only`, the debugger freezes non-target threads when executing those mover commands. Otherwise, the debugger resumes the thawed non-target threads.

A subsequent mover command completes when all the target threads have reached the destination the mover specifies. If you or an event interrupts the command before it completes, the command aborts.

If a target thread is frozen, the command aborts with an error message.

The debugger does not evaluate *target_thread_set* when you issue `idb target threads`. It does so before executing each subsquent mover command. For example:

```
(idb) set $foo = t:[1]
(idb) idb target threads $foo only
(idb) step
(idb) set $foo = t:[2]
(idb) step
```

The first `step` command steps thread `1` only, while the the second `step` command steps thread *2* only.

NOTE. The `thread` command specifies the thread to which non-mover commands apply, so it doesn't interact with this command.

The default target thread set, the set that movers use before you issue `idb target threads`, contains the last eventing thread to match the current mover behaviors.

To specify thread sets, use thread set notation.

See Also

info threads (gdb mode only)
thread
Process and Thread Set Notation

idb thaw (gdb mode only)

Set the execution attribute of the specified threads to `thawed`.

Syntax

```
idb thaw [thread_set]
```

Parameters

thread_set	A thread set.

Description

This command sets the execution attribute of the specified threads to `thawed`. If you do not specify any threads, the debugger uses the current thread.

A thawed thread resumes when you resume executing a set of threads in the job.

See Also

idb freeze (gdb mode only)
idb info thread (gdb mode only)
idb uninterrupt (gdb mode only)
"Working With Thread and Process Sets: Overview" in Chapter 6

idb uninterrupt (gdb mode only)

Set the execution attribute of the specified threads to `uninterrupt`.

Syntax

```
idb uninterrupt [thread_set]
```

Parameters

thread_set	A thread set.

Description

This command sets the execution attribute of the specified threads to `uninterrupt`. If you do not specify any threads, the debugger uses the current thread.

An uninterrupted thread continues running without being interrupted for events. It basically detaches the thread from the debugger's control.

See Also

idb freeze (gdb mode only)
idb info thread (gdb mode only)
idb thaw (gdb mode only)
"Working With Thread and Process Sets: Overview" in Chapter 6

idb unset solib-path-substitute (gdb mode only)

Remove a path substitution rule.

Syntax

```
idb unset solib-path-substitute [ dir_path ]
```

Parameters

dir_path	The shared library directory path specified in the debuggee.

Description

This command removes a path substitution rule for *dir_path* that you set with `idb set solib-path-substitute`. If you do not specify *dir_path*, the debugger removes all replacements.

Example

```
(idb) idb show solib-path-substitute
/usr/lib => /tmp/shlib
/usr/hal/lib => /tmp/hal/shlib
(idb) idb unset solib-path-substitute /usr/lib
(idb) idb show solib-path-substitute
/usr/hal/lib => /tmp/hal/shlib
```

See Also

idb set openmp-serialization (gdb mode only)
idb show solib-path-substitute (gdb mode only)

if

Conditionalize command execution.

Syntax

GDB Mode:

```
if expr
cmdlist
[else]
[cmdlist]
end
```

IDB Mode:

```
if "{" expr "}" "{" cmdlist "}" [ else "{" cmdlist "}" ]
```

Parameters

expr	The conditional expression.
cmdlist	The command list to be executed.

Description

This command defines the beginning of a conditional block.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the **Console** window in the GUI.

GDB Mode:

To define a conditional block, enter `if` *expr*, followed by each command in *cmdlist* on a separate line, an optional `else` clause, and finally, close the conditional block with `end`.

The debugger then evaluates the block.

IDB Mode:

In this command, the first *cmdlist* is executed if *expr* evaluates to a non-zero value. Otherwise, the *cmdlist* in the `else` clause is executed, if specified.

Example

GDB Mode:

```
(idb) p my_pid
$1 = -1
```

```
(idb) if my_pid == 0
 > print "is zero"
 > else
 > print "is not zero"
 >end
$2 = is not zero
(idb)
```

IDB Mode:

```
(idb) set $c = 1
(idb) assign pid = 0
(idb) if {pid < $c} { print "Greater" } else { print "Lesser" }
Greater
```

See Also

while

ignore (gdb mode only)

Set the ignore count of the specified breakpoint or watchpoint to the specified value.

Syntax

```
ignore ID count
```

Parameters

ID	ID of a breakpoint or watchpoint.
count	The number of encounters to be ignored. This number must be zero or greater.

Description

This command sets the ignore count for the specified breakpoint or watchpoint.

Watchpoints are also referred to as *data breakpoints*.

As long as the ignore count of a breakpoint or watchpoint is positive, execution does not stop there. Whenever execution encounters such a breakpoint or watchpoint, its ignore count is decreased by 1 and execution continues.

Example

```
(idb) ignore 12 100
```

See Also

break (gdb mode only)
clear (gdb mode only)
commands (gdb mode only)
condition (gdb mode only)
disable
enable
info breakpoints (gdb mode only)

ignore (idb mode only)

Ignore the specified signal.

Syntax

```
ignore [signal]
```

Parameters

signal	The signal to be ignored.

Description

This command ignores the specified signal.

To refrain from catching or handling the specified signal and pass it to your program, include *signal*. This command is equivalent to deleting the breakpoint created by a catch command for that signal.

To list all signals currently being ignored, do not include a *signal* parameter.

Example

```
(idb) ignore SIGILL
(idb) ignore
RTMIN, RTMIN1, RTMIN2, RTMIN3, RTMIN4, RTMIN5, RTMIN6, RTMIN7, RTMAX,
RTMAX7, RTMAX6, RTMAX5, RTMAX4, RTMAX3, RTMAX2, RTMAX1, HUP, KILL, ALRM,
TSTP, CONT, CHLD, WINCH, POLL
```

See Also

catch (idb mode only)

info args (gdb mode only)

Print the arguments of the current frame.

Syntax

```
info args
```

Parameters

None.

Description

The command prints the arguments of the selected frame, each on a separate line.

info breakpoints (gdb mode only)

Print information about one or more breakpoints.

Syntax

```
info breakpoints [expr]
```

Parameters

expr	An expression denoting the ID of a breakpoint

Description

This command prints information about the specified breakpoint. If you do not specify a breakpoint ID, the debugger prints information about all breakpoints.

Example

```
(idb) info breakpoints
Num Type           Disp Enb Address    What
1   breakpoint     keep y   0x08051603 in main at src/x_list.cxx:182
 breakpoint already hit 1 time(s)
2   breakpoint     keep y   0x0804ae5a in List<Node>::append(Node *
const) at src/x_list.cxx:148
 breakpoint already hit 1 time(s)
3   watchpoint     keep y   _firstNode
```

See Also

break (gdb mode only)
clear (gdb mode only)
commands (gdb mode only)
condition (gdb mode only)
disable
enable
help
ignore (gdb mode only)
status (idb mode only)
tbreak (gdb mode only)

info display (gdb mode only)

Print a list of expressions on display.

Syntax

```
info display
```

Parameters

None.

Description

This command prints a list of expressions on the automatic display list. The printed list displays item numbers, but not values.

The list includes

- enabled expressions
- disabled expressions, which are marked disabled
- expressions that refer to automatic variables not currently available

See Also

delete display (gdb mode only)
display (gdb mode only) Includes info on display lists.
disable display (gdb mode only)
enable display (gdb mode only)
undisplay (gdb mode only)

info files (gdb mode only)

Print the names of the files in the debuggee.

Syntax

```
info files
```

Parameters

None.

Description

This command prints the names of the following files in the debuggee:

- the executable file
- the core dump files that the debugger is currently using
- the files from which the debugger loaded symbols

This command is equivalent to `info target`.

Example

```
(idb) info files
Symbols from "/site/spt/usr1/c_code/hello".
Child process:
        Using the running image of child process 5133.
        While running this, IDB does not access memory from...
Local exec file:
        '/site/spt/usr1/c_code/hello', file type <unknown>
        0x8048000 - 0x80485fc is .text
        0x80495fc - 0x8049740 is .data
        0x8049740 - 0x8049740 is .bss
```

See Also

info target (gdb mode only)

info functions (gdb mode only)

Print names and types of functions.

Syntax

```
info functions [REGEXP]
```

Parameters

REGEXP	A regular expression.

Description

This command prints the names and types of defined functions. If you do not include a regular expression, it prints the names and types of all defined functions. If you include a regular expression, it prints the names and data types of all defined functions whose name contains a match for the expression.

The debugger's regular expression engine uses the Sun* Java* API class `java.util.regex`. For more information see `www.sun.com`.

For example, `info functions .*uname` finds all functions whose names include `uname`, `info functions ^uname` finds any functions whose names begin with `uname`. Use a backslash to escape special regular expression characters, such as `foo*()`.

Example

```
(idb) info functions
All defined functions:
File source/control.cpp:
Controller::Controller(void);
virtual float Controller::LimitingIO(float);
virtual void Controller::setDt(float);
virtual void Controller::setMax(void);
Controller::~Controller(void);
virtual float DController::calculate(float, float);
int runCplus(void);
char * table<char>::insert(char&, int);
table<char>::table(int);
table<char>::~table(void);
int * table<int>::insert(int&, int);
```

```
table<int>::table(int);
table<int>::~table(void);
<opaque> _Exit(...);
```

info handle (gdb mode only)

Print signal setting information.

Syntax

```
info handle
```

Parameters

None.

Description

This command prints the current settings for signal handling. You can change these settings with the `handle` command.

This command is not supported for Windows* OS targets.

Example

```
(idb) info handle
Signal        Stop      Print   Pass to program Description
SIGHUP        No        No      Yes             Hangup
SIGINT        Yes       Yes     No              Interrupt
...
```

See Also

handle (gdb mode only)
info signals (gdb mode only)

info line (gdb mode only)

Print start and end address of specified source line.

Syntax

```
info line num
```

Parameters

num	Source line for which you want the start and end address printed.

Description

This command prints the start and end address of the compiled code for the specified source line.

You can specify source lines in any of the formats described for the `list` command.

See Also

`list`

info locals (gdb mode only)

Print local variables of the selected function.

Syntax

```
info locals
```

Parameters

None.

Description

This command prints the local variables of the selected function, each on a separate line. These variables are all declared as either static or automatic, and are accessible at the point of execution of the selected frame.

See Also

dump (idb mode only)

info program (gdb mode only)

Print information about the debuggee.

Syntax

```
info program
```

Parameters

None.

Description

This command prints the following information about the status of the debuggee:

- whether it is running
- the process ID
- at which address it stopped
- the reason it stopped

Example

```
(idb) info program
 Using the running image of child process 23606.
Program stopped at 0x804b70c.
It stopped at breakpoint 3.
```

info registers (gdb mode only)

Print registers and their contents.

Syntax

```
info registers [ $register_name ]
```

Parameters

register_name	The name of a register.

Description

This command displays the contents of a register when you specify *register_name*, or all registers and their contents when you do not. This command enables you to examine sets of registers and individual registers.

Example

The following example shows how to examine sets of registers:

```
(idb) info registers $sp
$14 = (void *) 0xbfffe2cc
(idb) info registers
$eax 0x1 1
$ecx 0xbfffe42c -1073748948
$edx 0xbfffe3b0 -1073749072
$ebx 0xb74e7d98 -1219592808
$esp [$sp] 0xbfffe2cc (void *) 0xbfffe2cc
...
```

The following example shows two ways to examine the `eax` register:

```
(idb) info registers $eax
$eax            0x4 4
(idb) print $eax
$2 = 4
```

See Also

print
printregs (idb mode only)

info share (gdb mode only)

Print the names of shared libraries.

Syntax

```
info share
```

Parameters

None.

Description

This command is a synonym for `info sharedlibrary`.

See Also

`info sharedlibrary (gdb mode only)`

info sharedlibrary (gdb mode only)

Print the names of shared libraries.

Syntax

```
info sharedlibrary
```

Parameters

None.

Description

This command prints the names of all currently loaded shared libraries.

Example

```
(idb) info sharedlibary
From        To          Syms Read   Shared Object Library
0xffffe000  0xfff       Yes         [vdso]
```

See Also

info share (gdb mode only)

info signals (gdb mode only)

Print signal setting information.

Syntax

```
info signals
```

Parameters

None.

Description

This command is a synonym for `info handle`.

See Also

`info handle (gdb mode only)`

info source (gdb mode only)

Print information about the current source file.

Syntax

```
info source
```

Parameters

None.

Description

This command prints the path to the current source file, as specified during compilation.

See Also

info sources (gdb mode only)

info sources (gdb mode only)

Print names of all source files.

Syntax

```
info sources
```

Parameters

None.

Description

This command prints the names of all source files, as specified during compilation, for which there is debugging information. The names of source files are divided into the following groups:

- files for which debugging information has been read
- files for which debugging information has not yet been read

Example

```
(idb) info sources
Source files for which symbols have been read in:
source/control.cpp, source/control.h, source/crm.cpp,
source/externio.cpp, source/test1.cpp, source/test2.cpp, source/test2.h,
source/test.cpp
Source files for which symbols will be read in on demand:
```

See Also

info source (gdb mode only)

info stack (gdb mode only)

Print a backtrace of stack frames.

Syntax

```
info stack num
```

Parameters

num	The number of stack frames to print, starting from the current position.

Description

This command prints a backtrace of stack frames. This command is similar to `backtrace`.

See Also

backtrace (gdb mode only)

info target (gdb mode only)

Print the names of the files in the debuggee.

Syntax

```
info target
```

Parameters

None.

Description

This command is equivalent to `info files`.

See Also

`info files (gdb mode only)`

info threads (gdb mode only)

Print all threads.

Syntax

```
info threads
```

Parameters

None.

Description

This command prints a list of threads in the debuggee, including the following information:

- a thread ID that the debugger assigns
- a thread ID that the target system assigns
- a summary of the thread's current stack frame

An asterisk (*) preceding the thread ID indicates the current thread.

Example

```
(idb) info threads
    1 Thread 3074820864 (LWP 18872) [thawed]  0xb75a01fb in
pthread_cond_wait@@GLIBC_2.3.2 from /lib/tls/libpthread-0.60.so
    2 Thread 3074804656 (LWP 18873) [thawed]  0xb75a01fb in
pthread_cond_wait@@GLIBC_2.3.2 from /lib/tls/libpthread-0.60.so
    3 Thread 3064314800 (LWP 18875) [thawed]  0xb75a01fb in
pthread_cond_wait@@GLIBC_2.3.2 from /lib/tls/libpthread-0.60.so
    4 Thread 3053824944 (LWP 18876) [thawed]  0xb75a01fb in
pthread_cond_wait@@GLIBC_2.3.2 from /lib/tls/libpthread-0.60.so
*   5 Thread 3043335088 (LWP 18900) [thawed]  0x80487f3 in breakpoint1 at
/site/spt/anmod/sandbox-for-nightly/test/idb/Thread/src/pthread_prime_nu
mbers.c:24
```

See Also

show thread (idb mode only)

info types (gdb mode only)

Print a description of types in the program.

Syntax

```
info types [REGEXP]
```

Parameters

REGEXP	A regular expression pattern to match.

Description

This command prints a description of types in your program.

If you specify *REGEXP*, the debugger prints a description of types whose names match the regular expression.

If you do not specify *REGEXP*, the debugger prints a description of all types.

The debugger matches each complete type name as though it is a complete line. For example, `info type foo` prints information on all types in the debuggee whose names include the string `foo`. However, `info type ^foo$` prints information only for types whose complete name is `foo`.

This command is similar to `ptype`, but differs in that it does not print a detailed description.

See Also

`ptype (gdb mode only)`

info variables (gdb mode only)

Print names and types of all global variables.

Syntax

```
info variables
```

Parameters

None.

Description

This command prints the names and types of all global variables

info watchpoints (gdb mode only)

Print information about one or more watchpoints.

Syntax

```
info watchpoints [expr]
```

Parameters

expr	An expression denoting the ID of a watchpoint.

Description

This command prints information about the specified watchpoint. If you do not specify an ID, the debugger prints information about all watchpoints.

Watchpoints are also referred to as *data breakpoints*.

This command is the same as `info breakpoints`.

Example

```
(idb) info watchpoints
Num Type           Disp Enb Address    What
1   breakpoint     keep y   0x08051603 in main at src/x_list.cxx:182
 breakpoint already hit 1 time(s)
2   breakpoint     keep y   0x0804ae5a in List<Node>::append(Node *
const) at src/x_list.cxx:148
 breakpoint already hit 1 time(s)
3   watchpoint     keep y   _firstNode
```

See Also

info breakpoints (gdb mode only)
status (idb mode only)

jump (gdb mode only)

Jump to the specified line number or address.

Syntax

```
jump { num | *addr }
```

Parameters

num	Number of the line to jump to.
addr	Address of the instruction to jump to.

Description

This command jumps the program counter to the specified location. The debugger resumes program execution at that point unless it encounters a breakpoint there.

NOTE. A jump does not change the stack frame or any memory contents. Jumping from one routine to another can lead to unpredictable results.

The `tbreak` command is commonly used in conjunction with this command.

One way you can use this command is to go to a section of the debuggee that has already executed, in order to examine it more closely.

If *num* is in a function other than the one currently executing, and the two functions require different argument patterns or different patterns for local variables, the output of this command may be unpredictable.

Because of this behavior, when *num* is not in the current function, the debugger prompts you to confirm this command.

This command is similar to storing a new value in the `$pc` register, in that it changes the address from which the application continues executing. For example, the command set `$pc = 0x123` causes the next `continue` command to continue from the address `0x123`.

See Also

goto (idb mode only)

kill

Kill the current process.

Syntax

```
kill
```

Parameters

None.

Description

This command kills the current process, leaving the debugger running. Any breakpoints previously set are retained. Later, you can execute the program again, by using the `run` command in GDB mode or the `rerun` command in IDB mode, without loading the debuggee again.

Example

GDB Mode:

```
(idb) info program
Using the running image of child process 17629.
Program stopped at 0x8051603.
It stopped at breakpoint 1.
(idb) kill
Program exited normally.
(idb) run
Starting program: /home/user/examples/x_list
Breakpoint 1, main () at src/x_list.cxx:182
182 List<Node> nodeList;
```

IDB Mode:

```
(idb) show process
Current Process: localhost:17336 (/home/user/examples/x_list)
paused.
(idb) kill
Process has exited
(idb) rerun
```

```
[1] stopped at [int main(void):182 0x08051603]
182 List<Node> nodeList;
```

See Also

run
rerun (idb mode only)

list

Display lines of source code.

Syntax

Use one of the following forms:

GDB Mode:

```
list
list [ file_name:]line_expression
list begin,end
list begin,
list ,end
list +[num]
list -[num]
list *address
```

IDB Mode:

```
list [ line_expression ]
list begin , end
list begin : num
```

Parameters

line_expression — An expression that evaluates to an integer or the name of a function whose source code you want to display. The syntax of the command and the expression determine how the debugger evaluates *line_expression*.

When this expression is an integer, it can be the line number of the source code you want to display or any of the following parameters:

- *begin*
- *end*
- *+num*
- *–num*

begin — An expression that evaluates to the line number at the beginning of the range of source code you want to display.

end — An expression that evaluates to the line number at the end of the range of source code you want to display.

num — The number of lines to print.

GDB Mode:

Default is 10.

file_name — The name of the file containing the source code you want to print.

line_number — The line number of the source code you want to display.

function — The name of the function whose source code you want to display.

address — The address of the instruction that the compiler outputs from a line of source code.

Description

This command displays lines of source code, as specified by one of the following items:

- The position of the program counter
- The last line listed, if multiple list commands have been entered
- The line numbers specified as the arguments to the list command

GDB Mode:

If you do not specify a parameter, the debugger prints the ten lines surrounding the current line. If the last line that the debugger printed was the output of this command, the debugger prints the lines following the last line it printed. If the last line it printed was a single line that the debugger printed as part of a stack frame, the debugger prints the lines centered around that line.

If you specify only *line_number* or *function*, the debugger prints the lines centered around the specified line or the beginning of the function. By default, the debugger prints ten lines.

If you specify *begin* and *end*, the debugger prints the lines beginning with *begin* and ending with *end*. If you specify only begin or end, the debugger prints the ten lines either following *begin* or preceding *end*.

`list +` prints *num* lines after the last printed. `list -` prints *num* lines before the last printed. If you do not include *num*, the debugger prints ten lines.

If you specify `*`*address*, the debugger prints the line that was compiled to an instruction at the specified program address.

IDB Mode:

If you specify only *line_number* or *function*, the debugger prints the lines starting with the specified line or the beginning of the function. By default, the debugger prints ten lines.

If you specify *begin* `,` *end*, the debugger prints the lines beginning with *begin* and ending with *end*. If you specify *begin* `:` *num*, the debugger prints *num* lines, beginning with *begin*.

If you do not specify *end* or *num*, the debugger shows 20 lines, or fewer if it reaches the end of source file.

Example

For example, to list lines 16 through 20:

```
(idb) list 16,20
16
17 class Node {
18 public:
19 Node ();
20
```

To list 6 lines, beginning with line 16:

GDB Mode:

```
(idb) list 16,+6
16
17 class Node {
18 public:
19 Node ();
20
21 virtual void printNodeData() const = 0;
```

Here are some other examples of the list command:

```
list -2,
list ,+2
list -2,+2
list myfile:2
list myfile:2,
list ,myfile:2
list myfile:2,myfile:3
list myfile:bar
list myfile:bar,
list ,myfile:bar
list myfile:bar,myfile:foo
list *0x123
```

IDB Mode:

```
(idb) list 16:6
16
17 class Node {
18 public:
19 Node ();
20
21 virtual void printNodeData() const = 0;
```

See Also

set listsize (gdb mode only)

listobj (idb mode only)

List all loaded objects, including the main image and the shared libraries.

Syntax

```
listobj
```

Parameters

None.

Description

This command lists all loaded objects, including the main image and the shared libraries.

For each object, the information listed consists of:

- the full object name, with path name
- the starting address for the text
- the size of the text region
- whether the debugger has read the symbol table information

Example

```
(idb) listobj
section Start Addr End Addr
-------------------------------------------------------------------------
/home/user/examples/test/idb/Examples/exp/i686-Linux-currstable/debuggab
le/x_list
.text 0x8048000 0x80555cf
.data 0x8056000 0x805be07
.bss 0x805be08 0x805bebf
/lib/libdl-2.3.2.so
.text 0xb73b1000 0xb73b2dc3
.data 0xb73b3dc4 0xb73b3f53
.bss 0xb73b3f54 0xb73b3f73
/lib/tls/libc-2.3.2.so
.text 0xb73b4000 0xb74e44f5
.data 0xb74e5500 0xb74e7fdb
.bss 0xb74e7fdc 0xb74eaa8b
```

```
/nfs/cmplr/icc-9.1.043/lib/libunwind.so.5
.text 0xb74eb000 0xb74ef28c
.data 0xb74f0290 0xb74f0a1b
.bss 0xb74f0a1c 0xb74f0b7b
/nfs/cmplr/icc-9.1.043/lib/libcxa.so.5
.text 0xb74f1000 0xb750cd5e
.data 0xb750d000 0xb7513bcb
.bss 0xb7513bcc 0xb7513d4f
/nfs/cmplr/icc-9.1.043/lib/libcprts.so.5
.text 0xb7514000 0xb7594aaf
.data 0xb7595000 0xb75b3d23
.bss 0xb75b3d24 0xb75b469f
/lib/tls/libm-2.3.2.so
.text 0xb75b5000 0xb75d5dbf
.data 0xb75d6dc0 0xb75d6f43
.bss 0xb75d6f44 0xb75d6f8f
/lib/ld-2.3.2.so
.text 0xb75eb000 0xb75fffcf
.data 0xb7600000 0xb7600533
.bss 0xb7600534 0xb7600753
```

See Also

info share (gdb mode only)
info sharedlibrary (gdb mode only)

load (idb mode only)

Load an executable and core file for debugging.

Syntax

```
load filename [corefilename]
```

Parameters

filename	The executable file for the debugger to load.
corefilename	The name of the core file to load.

Description

This command specifies an executable and core file for debugging.

This command reads the symbolic information for an executable file and the shared libraries it uses, if available. Objects compiled without debug information do not have symbols to load.

This command can optionally load a core file. If you specify a core file, the debugger acts as though it is attached to the process at the point just before it died. However, you cannot execute commands that require a runnable process, such as commands that try to continue the process or evaluate function calls.

Loading a process makes the debugger aware of it and makes it the current process that the debugger controls.

The opposite of loading an executable file is unloading an executable file, during which the debugger removes all related symbol table information that the debugger associated with the debuggee.

Example

```
% idb /home/user/examples/x_list
(idb) listobj
Program is not active
(idb) load /home/user/examples/x_list
Reading symbolic information from
/home/user/examples/test/idb/Examples/exp/i686-Linux-currstable/debuggab
le/x_list...done
(idb) listobj
section Start Addr End Addr
-------------------------------------------------------------------------
```

```
/home/user/examples/test/idb/Examples/exp/i686-Linux-currstable/debuggab
le/x_list
.text 0x8048000 0x80555cf
.data 0x8056000 0x805be07
.bss 0x805be08 0x805bebf
/lib/libdl-2.3.2.so
.text 0xb73b1000 0xb73b2dc3
.data 0xb73b3dc4 0xb73b3f53
.bss 0xb73b3f54 0xb73b3f73
/lib/tls/libc-2.3.2.so
.text 0xb73b4000 0xb74e44f5
.data 0xb74e5500 0xb74e7fdb
.bss 0xb74e7fdc 0xb74eaa8b
/nfs/cmplr/icc-9.1.043/lib/libunwind.so.5
.text 0xb74eb000 0xb74ef28c
.data 0xb74f0290 0xb74f0a1b
.bss 0xb74f0a1c 0xb74f0b7b
/nfs/cmplr/icc-9.1.043/lib/libcxa.so.5
.text 0xb74f1000 0xb750cd5e
.data 0xb750d000 0xb7513bcb
.bss 0xb7513bcc 0xb7513d4f
/nfs/cmplr/icc-9.1.043/lib/libcprts.so.5
.text 0xb7514000 0xb7594aaf
.data 0xb7595000 0xb75b3d23
.bss 0xb75b3d24 0xb75b469f
/lib/tls/libm-2.3.2.so
.text 0xb75b5000 0xb75d5dbf
.data 0xb75d6dc0 0xb75d6f43
.bss 0xb75d6f44 0xb75d6f8f
/lib/ld-2.3.2.so
.text 0xb75eb000 0xb75fffcf
.data 0xb7600000 0xb7600533
.bss 0xb7600534 0xb7600753
```

See Also

unload (idb mode only)
file (gdb mode only)

map source directory (idb mode only)

Map one source directory to another one.

Syntax

```
map source directory from_directory_name to_directory_name
```

Parameters

from_directory_name	The directory from which you want to map.
to_directory_name	The directory to which you want to map.

Description

This command tells the debugger that the source files in the directory *from_directory_name* can be found in the directory *to_directory_name*.

The directory used in the source specification in the compile command is the base for the *from_directory_name*. The compiler combines the file path in the compile command and the user's current directory at the time of the compilation and attempts to simplify the file path so that it is a relative path from that current working directory.

See Also

set substitute-path (gdb mode only)

next

Step forward in source, over any function calls.

Syntax

```
next [expr]
```

Parameters

expr	A numeric expression.

Description

This command executes a line of source code. When the next line to be executed contains a function call, the debugger executes the function being called and stops the process at the line immediately following the function call.

If you specify *expr*, the debugger evaluates the expression as a positive integer that specifies the number of times to execute the `next` command. The expression can be any expression that is valid in the current context.

Example

GDB Mode:

```
(idb) list +0,+4
151       Node* currentNode = _firstNode;
152       while (currentNode->getNextNode())
153             currentNode = currentNode->getNextNode();
154       currentNode->setNextNode(node);
(idb) next
152       while (currentNode->getNextNode())
(idb) next
153             currentNode = currentNode->getNextNode();
(idb) next
152       while (currentNode->getNextNode())
(idb) next
154       currentNode->setNextNode(node);
```

IDB Mode:

```
(idb) list $curline:4
```

```
> 151       Node* currentNode = _firstNode;
  152       while (currentNode->getNextNode())
  153             currentNode = currentNode->getNextNode();
  154       currentNode->setNextNode(node);
(idb) next
stopped at [void List<Node>::append(class Node* const):152
0x0804c579]
152         while (currentNode->getNextNode())
(idb) next
stopped at [void List<Node>::append(class Node* const):153
0x0804c592]
153             currentNode = currentNode->getNextNode();
(idb) next
stopped at [void List<Node>::append(class Node* const):152
0x0804c5aa]
152       while (currentNode->getNextNode())
(idb) next
stopped at [void List<Node>::append(class Node* const):154
0x0804c5c3]
154       currentNode->setNextNode(node);
```

See Also

nexti
run
step
stepi

nexti

Step forward in assembler instructions, over any function calls.

Syntax

```
nexti [expr]
```

Parameters

expr	A numeric expression.

Description

This command executes a machine instruction. When the instruction contains a function call, the command executes the function being called and stops the process at the instruction immediately following the call instruction.

If you specify *expr*, the debugger evaluates the expression as a positive integer that specifies the number of times to execute the `nexti` command. The expression can be any expression that is valid in the current context.

See Also

next
run
step
stepi

output (gdb mode only)

Print the value of an expression.

Syntax

```
output /format expr
```

Parameters

format	The format in which to print the expression.
expr	The expression to be printed.

Description

This command prints the value of the specified expression.

This command is very similar to the `print` command. The differences are:

- This command does not print a newline at the end of the value.
- This command does not add a value to the value history.

See print commands for details about *format*.

See Also

print
printf

patch (idb mode only)

Modify an executable by writing the value of an expression to a specific address.

Syntax

```
patch addr = expr
```

Parameters

addr	The address whose value you want to set.
expr	The value for the address.

Description

This command modifies an executable by writing the value of an expression to a specified address.

Use this command to correct bad data or instructions in executable disk files. You can patch text, initialized data, or read-only data areas. You cannot patch the `bss` segment, or stack and register locations, because they do not exist on disk files.

Only use this command to change the on-disk binary file. To modify debuggee memory, use the `assign` command. If the image is executing when you issue the `patch` command, the corresponding location in the debuggee address space is updated as well. The debuggee is updated regardless of whether the patch to disk succeeded, as long as the `assign` command can process the source and destination expressions. If your program is loaded but not yet started, the patch to disk is performed without the corresponding assign to memory.

When you use the `patch` command, the debugger saves the original binary with the string `~backup` appended to the file name, so you can revert to the original binary if necessary. The debugger may also create a file with the string `~temp` appended to the file name. The debugger may delete this file after the debugging session is over.

Example

```
(idb) run
[1] stopped at [int main(void):24 0x120001324]
24 return 0;
(idb) patch i = 10
0x1400000d0 = 10
(idb) patch j = i + 12
0x1400000d8 = 22
```

```
(idb)
```

See Also

assign (idb mode only)

path (gdb mode only)

Add specified directory to search path.

Syntax

```
path dirname
```

Parameters

dirname	The directory to add to the search path.

Description

This command adds the specified directory to the search path for object files, the PATH environment variable, for the current debuggee process.

See Also

setenv (idb mode only)

playback input (idb mode only)

Execute commands from a file.

Syntax

```
playback input filename
```

Parameters

filename	The file from which to execute commands.

Description

This command executes commands from a file to automate tasks. You can record commands to a file using the `record` and `unrecord` commands, or by using the GUI.

Example

```
(idb) record input myscript
(idb) print "Hello World"
Hello World
(idb) unrecord input
(idb) playback input myscript
Hello World
(idb)
```

See Also

record (idb mode only)
source
unrecord (idb mode only)

pop (idb mode only)

Remove frames from the call stack.

Syntax

```
pop [expr]
```

Parameters

expr	The stack frame to be removed.

Description

This command removes one or more call frames from the call stack.

By default, this command removes one call frame. This command undoes the work already done by the removed execution frames. However, it does not, reverse side effects, such as changes to global variables.

Because it is extremely unlikely this will fix all the effects of a half-executed call, this command is not recommended for general use. Furthermore, the `pop` command does not provide a way to specify a return value when the frame being discarded corresponds to a function that should return a value. You may need to use the `assign` command to restore the values of global variables.

Instead of using the `pop` command, you may want to use the IDB mode `return` command, which causes the called routine to resume execution and eventually return to the caller.

See Also

`return (idb mode only)`
`return (gdb mode only)`

print

Print the value of an expression.

Syntax

GDB Mode:

`print [/format] [expr]`

IDB Mode:

`printradix expr[,...]`

`print printable_type`

Parameters

format

GDB Mode:

Specifies the format in which to print the expression. Use one of the following values:

`x`

Regard the bits of the value as an integer, and print the integer in hexadecimal.

`d`

Print as integer in signed decimal.

`u`

Print as integer in unsigned decimal.

`o`

Print as integer in octal.

`t`

Print as integer in binary. The letter `t` stands for *two*.

`a`

Print as an address, both absolute in hexadecimal and as an offset from the nearest preceding symbol.

`c`

Regard as an integer and print it as a character constant.

`f`

Regard the bits of the value as a floating-point number and print using typical floating point syntax.

expr

The expression to print.

Expressions in the debugger are valid expressions in the language in which your program is written.

The debugger attempts to duplicate the standard language semantics for expressions.

An expression can include a qualifier and a tick mark, which can help identify ambiguous expressions. For example, if both `a.cxx` and `b.cxx` inlcude a file level variable, `x`, you can use the syntax `"a.cxx"`x` to specify the variable `x` in `a.cxx`. Use the same syntax to specify object hierarchy.

IDB Mode:

Use commas to separate multiple expressions.

To print an expression including the C/C++ comma operator, you must enclose the expression in parentheses.

radix

IDB Mode:

`x`

Regard the bits of the value as an integer, and print the integer in hexadecimal.

`d`

Print as integer in signed decimal.

`o`

Print as integer in octal.

`b`

Print as integer in binary.

filename

IDB Mode:

The name of the file containing the expression to print.

printable_type

IDB Mode:

A user-defined type for which you have debug information.

Description

This command prints the value of an expression. You can print the values of one or more expressions or all local variables. You can also use the `print` command to evaluate complex expressions involving typecasts, pointer dereferences, multiple variables, constants, and any legal operators allowed by the language of the program you are debugging.

For an array, the debugger prints every cell in the array if you do not specify a specific cell.

GDB Mode:

Use the `set output-radix` *x* command to select a radix for the output of the `print` command, where *x* can be 8, 10 or 16.

IDB Mode:

Use the `$`*hexints*, `$`*decints*, or `$`*octints* variables to select a radix for the output of the `print` command. If you do not want to change the radix permanently, use the `printx`, `printd`, `printo`, and `printb` commands to print expressions in hexadecimal, decimal, octal, or binary base format, respectively.

Example

Consider the following declarations in a C++ program:

GDB Mode:

```
(idb) list 59,+2
59 const unsigned int biggestCount = 10;
60 static Moon *biggestMoons[biggestCount];
```

IDB Mode:

```
(idb) list 59:2
59 const unsigned int biggestCount = 10;
60 static Moon *biggestMoons[biggestCount];
```

The following example uses the `print` command to display a non-string array:

GDB Mode:

```
(idb) print biggestMoons
$4 = {0x8067998, 0x8067cb0, 0x80679f0, 0x80678e8, 0x8067730, 0x8067940,
0x8068020, 0x8067f18, 0x8067c58, 0x8067f70}
```

IDB Mode:

```
(idb) print biggestMoons
[0] = 0x8067998,[1] = 0x8067cb0,[2] = 0x80679f0,[3] = 0x80678e8,[4] =
0x8067730,[5] = 0x8067940,[6] = 0x8068020,[7] = 0x8067f18,[8] =
0x8067c58,[9] = 0x8067f70
```

The following example shows how to print individual values of an array:

GDB Mode:

```
(idb) print biggestMoons[3]
$7 = (Moon *) 0x80678e8
(idb) print *biggestMoons[3]
$8 = {<Planet> = {<HeavenlyBody> = {_name = 0x805a514 "Io",
_innerNeighbor = 0x0, _outerNeighbor = 0x8067940, _firstSatellite = 0x0,
_lastSatellite = 0x0}, <Orbit> = {_primary = 0x8067890, _distance = 422,
_name = 0x8067918 "Jupiter 1"}}, _radius = 1815}
```

IDB Mode:

```
(idb) print biggestMoons[3]
0x80678e8
(idb) print *biggestMoons[3]
class Moon {
_radius = 1815;
_name = 0x805a514="Io"; // class Planet::HeavenlyBody
_innerNeighbor = 0x0; // class Planet::HeavenlyBody
_outerNeighbor = 0x8067940; // class Planet::HeavenlyBody
_firstSatellite = 0x0; // class Planet::HeavenlyBody
_lastSatellite = 0x0; // class Planet::HeavenlyBody
```

```
_primary = 0x8067890; // class Planet::Orbit
_distance = 422; // class Planet::Orbit
_name = 0x8067918="Jupiter 1"; // class Planet::Orbit
```

See Also

printf
printi

printenv (idb mode only)

Display the value of one or all environment variables.

Syntax

```
printenv [varname]
```

Parameters

varname	The environment variable whose value you want to display.

Description

This command displays the value of one environment variable if you specify *varname*, or all environment variables if you omit *varname*.

Example

The following example displays the value of all environment variables.

```
(idb) printenv
DESKTOP_STARTUP_ID=
DISPLAY=:1.0
HISTCONTROL=ignoreboth
HOME=/home/hal
LESSCLOSE=/usr/bin/lesspipe %s %s
LESSOPEN=| /usr/bin/lesspipe %s
...
runlevel=2
(idb)
```

The following example displays the value of the **HOME** environment variable.

```
(idb) printenv HOME
HOME=/home/hal
(idb)
```

See Also

export (idb mode only)
setenv (idb mode only)

printf

Display a complex structure with formatting.

Syntax

```
printf format [, expr,…]
```

Parameters

format	A string expression of characters and conversion specifications using the same format specifiers as the `printf` C function.
expr,…	One or more expressions separated by commas.

Description

This command formats and displays a complex structure. This command requires a running target program because it uses `libc`. A comma must precede the first *expr* if there is one. Separate expressions with commas.

Example

```
(idb) printf "The PC is 0x%x", $pc
The PC is 0x8051a3c
```

printi

Display the value as an assembly instruction.

Syntax

```
printi [expr,...]
```

Parameters

expr,...	One or more expressions separated by commas.

Description

This command takes one or more numerical expressions and interprets each one as an assembly instruction, printing out the instruction, and its arguments when applicable.

This command is typically used by engineers performing machine-level debugging.

Example

```
(idb) $curpc/1i
int main(void): src/x_list.cxx
*[line 182, 0x08051603] main+0x1b:                    pushl    %edi
(idb) $curpc/1dd
0x08051603:   2022018391
(idb) printi $pc
main+0x1b:                    pushl    %edi
(idb) $curpc/1i
```

printregs (idb mode only)

Display the values of hardware registers.

Syntax

```
printregs
```

Parameters

None.

Description

This command displays the values of all the hardware registers. The list of registers the debugger displays is machine-dependent.

By default, the debugger displays most values in decimal radix. To display the register values in hexadecimal radix, set the `$hexints` variable to 1.

Example

```
(idb) printregs
$eax            0x805be28 134594088
$ecx            0xb74e61a0 -1219599968
$edx            0xb74e5610 -1219602928
$ebx            0xb74e7d98 -1219592808
$esp [$sp]      0xbfff83a8 -1073773656
$ebp [$fp]      0xbfff8478 -1073773448
$esi            0xbfff8504 -1073773308
$edi            0xb74e567c -1219602820
$eip [$pc]      0x8051a3c 134552124
$eflags         0x286 646
$cs             0x23 35
$ss             0x2b 43
$ds             0x2b 43
$es             0x2b 43
$fs             0x0 0
$gs             0x33 51
$orig_eax       0xffffffff -1
```

```
$fctrl          0x37f 895
$fstat          0x0 0
$ftag           0x0 0
$fiseg          0x23 35
$fioff          0x804ea61 134539873
$foseg          0x2b 43
$fooff          0xbfff81c4 -1073774140
$fop            0x89 137
$f0             0x0 0
$f1             0x0 0
$f2             0x0 0
$f3             0x0 0
$f4             0x0 0
$f5             0x0 0
$f6             0x0 0
$f7             0xa1f7cf0000000000 10.1230001449584961
$xmm0           0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_double = [0] = 0,[1] = 0;
  v16_int8 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0,[8] = 0,[9] = 0,[10] = 0,[11] = 0,[12] = 0,[13] = 0,[14] = 0,[15] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_int64 = [0] = 0,[1] = 0;
}
$xmm1           0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_double = [0] = 0,[1] = 0;
  v16_int8 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0,[8] = 0,[9] = 0,[10] = 0,[11] = 0,[12] = 0,[13] = 0,[14] = 0,[15] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
```

```
  v2_int64 = [0] = 0,[1] = 0;
}
$xmm2           0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_double = [0] = 0,[1] = 0;
  v16_int8 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0,[8] = 0,[9] = 0,[10] = 0,[11] = 0,[12] = 0,[13] = 0,[14] = 0,[15] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_int64 = [0] = 0,[1] = 0;
}
$xmm3           0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_double = [0] = 0,[1] = 0;
  v16_int8 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0,[8] = 0,[9] = 0,[10] = 0,[11] = 0,[12] = 0,[13] = 0,[14] = 0,[15] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_int64 = [0] = 0,[1] = 0;
}
$xmm4           0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_double = [0] = 0,[1] = 0;
  v16_int8 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0,[8] = 0,[9] = 0,[10] = 0,[11] = 0,[12] = 0,[13] = 0,[14] = 0,[15] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_int64 = [0] = 0,[1] = 0;
}
$xmm5           0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
```

```
  v2_double = [0] = 0,[1] = 0;
  v16_int8 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0,[8] = 0,[9] = 0,[10] = 0,[11] = 0,[12] = 0,[13] = 0,[14] = 0,[15] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_int64 = [0] = 0,[1] = 0;
}
$xmm6           0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_double = [0] = 0,[1] = 0;
  v16_int8 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0,[8] = 0,[9] = 0,[10] = 0,[11] = 0,[12] = 0,[13] = 0,[14] = 0,[15] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_int64 = [0] = 0,[1] = 0;
}
$xmm7           0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_double = [0] = 0,[1] = 0;
  v16_int8 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0,[8] = 0,[9] = 0,[10] = 0,[11] = 0,[12] = 0,[13] = 0,[14] = 0,[15] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7]
= 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_int64 = [0] = 0,[1] = 0;
}
$mxcsr          0x1f80 8064
$vfp            0xbfff8480 -1073773440
```

See Also

"$hexints" in Chapter 8
info registers (gdb mode only)

printt (idb mode only)

Interpret integer values as seconds since the Epoch.

Syntax

```
printt  expression[,...]
```

Parameters

expression

Description

This command interprets integer values as seconds since the Epoch.

For more information, see the man pages for `ctime`.

process (idb mode only)

Show or change the current process.

Syntax

```
process [ ID | filename ]
```

Parameters

ID	ID of the process to which you want to switch.
filename	Name of the file to which you want to switch.

Description

This command shows the current process or it changes the current process if you specify ID or filename.

The process you switch away from remains stalled until the debugger exits or until you switch to it and continue it.

Example

The following example creates two processes and switches from one to the other:

```
(idb) process
There is no current process.
You may start one by using the `load' or `attach' commands.
(idb) load x_list
Reading symbolic information from
/home/user/examples/x.x_processes/x_list...done
(idb) process
>localhost:20492 (/home/user/examples/x.x_processes/x_list) loaded.
(idb) set $old_process = $curprocess
(idb) printf "$old_process=%d", $old_process
$old_process=20492
(idb) load x_segv
Reading symbolic information from
/home/user/examples/x.x_processes/x_segv...done
(idb) process
```

```
localhost:20492 (/home/user/examples/x.x_processes/x_list) loaded.
>localhost:20492 (/home/user/examples/x.x_processes/x_segv) loaded.
(idb) process 20492
(idb) process
>localhost:20492 (/home/user/examples/x.x_processes/x_list) loaded.
localhost:20492 (/home/user/examples/x.x_processes/x_segv) loaded.
```

See Also

attach
load (idb mode only)
show process (idb mode only)
show process set

ptype (gdb mode only)

Print the type declaration of the specified type, or the last value in history.

Syntax

```
ptype [name]
```

Parameters

name	Type for which you want the type declaration to be printed.

Description

This command prints a detailed description of a type, or the type of the last value in the command history.

This command is similar to `whatis`, but `whatis` prints just the name of the type.

Example

The following example applies if the command history contains the type `String`, but not the type `bitfield`.

```
(idb) ptype
type = String

(idb) ptype bitfield
type = void ()
```

See Also

whatis

pwd (gdb mode only)

Display the current working directory.

Syntax

```
pwd
```

Parameters

None.

Description

This command displays the current working directory.

Example

```
(idb) pwd
Working directory /home/hal/myapp
```

quit

Exit the debugger.

Syntax

GDB Mode:

`quit [exit_status]`

IDB Mode:

`quit`

Parameters

GDB Mode:

exit_status	An expression for the exit status.

IDB Mode:

None

Description

This command exits the debugger.

GDB Mode:

If you supply *exit_status*, the debugger exits using the *exit_status* expression as the exit status. Otherwise, it exits with status 0.

See Also

"Exiting the Debugger" in Chapter 3
exit (idb mode only)

readsharedobj (idb mode only)

Read symbol information for a shared object.

Syntax

`readsharedobj` *`filename`*

Parameters

`filename`	The shared object.

Description

This command reads the symbol table information for the specified shared object. The object must be a shared library. You can use this command only when you specify the debuggee by loading the debuggee with the `load` command or with the GUI.

See Also

`delsharedobj (idb mode only)`
`listobj (idb mode only)`

record (idb mode only)

Record debugger interactions to a file.

Syntax

```
record { input | output | io } [file]
```

Parameters

file	The file to which you want to record interactions.
input	Records input only.
output	Records output only.
io	Records input and output.

Description

This command records debugger input, output, or both.

To help you make command files, as well as to help you see what has happened before, the debugger can write both its input and its output to files.

The `record input` command saves debugger commands to a file. You can execute the commands in the file using the `source` command or the `playback input` command.

If you do not specify a file name, the debugger creates a file with a random file name in `/tmp` as the record file. The debugger issues a message giving the name of that file.

The `record output` command saves the debugger output to a file. The output is simultaneously written to `stdout` (normal output) or `stderr` (error messages).

To stop recording debugger input or output, use the appropriate version of the `unrecord` command, then exit the debugger, or redirect the command to `/dev/null`, as shown in the following example:

```
(idb) record input /dev/null
(idb) record output /dev/null
(idb) record io /dev/null
```

The `record io` command saves both input to and output from the debugger. If the debugger is already recording input or output when you invoke this command, the debugger closes the old file and records to a new one. It does not record simultaneously to two files.

`record io` is equivalent to the combination of `record input` and `record output`, and closes any open recording files.

NOTE. Only the `record io` command records the prompt itself.

Example

The following example shows how to use the `record input` command to record a series of debugger commands in a file named `myscript`:

```
(idb) record input myscript
(idb) stop in main
[#1: stop in int main(void)]
(idb) run
[1] stopped at [int main(void):182 0x08051603]
182 List<Node> nodeList;
(idb) unrecord input
This example results in the following recorded input in myscript:
(idb) sh cat myscript
stop in main
run
unrecord input
```

The following example shows how to use the `record output` command to record a series of debugger commands in a file named `myscript`:

```
(idb) record output myscript
(idb) stop in List<Node>::append
[#2: stop in void List<Node>::append(class Node* const)]
(idb) cont
[2] stopped at [void List<Node>::append(class Node* const):148
0x0804ae5a]
148 if (!_firstNode)
(idb) cont to 156
stopped at [void List<Node>::append(class Node* const):156 0x0804aed7]
156 }
(idb) unrecord output
```

After the above commands are executed, `myscript` contains the following:

```
(idb) sh cat myscript
[#2: stop in void List<Node>::append(class Node* const)]
[2] stopped at [void List<Node>::append(class Node* const):148
0x0804ae5a]
148 if (!_firstNode)
stopped at [void List<Node>::append(class Node* const):156 0x0804aed7]
   156 }
```

The following example shows how `record io` records input and output.

```
(idb) record io myscript
(idb) stop in main
[#1: stop in int main(void) ]
(idb) run
[1] stopped at [int main(void):12 0x120001130]
12 int i;
(idb) quit
% cat myscript
(idb) stop in main
[#1: stop in int main(void) ]
(idb) run
[1] stopped at [int main(void):12 0x120001130]
12 int i;
(idb) quit
```

See Also

"Scripting Commands" in Chapter 5
playback input (idb mode only)
source

rerun (idb mode only)

Restart the program.

Syntax

```
rerun [ args ] [ IO_redirection ... ]
```

Parameters

argument_string	The arguments to pass to the debuggee. Provides both the `argc` and `argv` for the created process in the same way a shell does.
IO_redirection ...	Enables you to change `stdin`, `stdout`, and `stderr`, which are otherwise inherited from the debugger process. You can enter the following values: *> filename* Redirect `stdout` *1> filename* Redirect `stdout` *2> filename* Redirect `stderr` *>& filename* Redirect `stdout` and `stderr` *1> filename 2> filename* Redirect `stdout` and `stderr` to different files

Description

This command restarts the debuggee.

When you do not include any parameters, this command uses the arguments and the *IO_redirection* arguments of the most recent `run` command entered with arguments. If there was no previous `run` command, the `rerun` command defaults to `run`.

If the last modification time or size of the binary file or any of the shared objects used by the binary file has changed since you issued the last `run` or `rerun` command, the debugger automatically rereads the symbol table information. When this happens, the old breakpoint settings may no longer be valid after the debugger reads the new symbol table information.

The debugger breaks up the argument string into words, and supports several shell features, including tilde (~) and environment variable expansion, wildcard substitution, single quote ('), double quote ("), and single character quote (\).

The *IO_redirection* argument enables you to change stdin, stdout, and stderr, which are otherwise inherited from the debugger process.

The various forms have the same effect as in the csh(1) shell.

Example

```
(idb) stop at 182
[#1: stop at "src/x_list.cxx":182]
(idb) rerun -s > prog.output
[1] stopped at [int main(void):182 0x08051603]
182 List<Node> nodeList;
```

See Also

run

return (gdb mode only)

Remove frames from the call stack.

Syntax

`return [expr]`

Parameters

expr	The frames to be removed from the call stack.

Description

When you use `return`, the selected stack frame is discarded, and all frames within it. To specify a value to be returned, specify that value in *expr*.

The `return` command does not resume execution. It leaves the program stopped in the state that would exist if the function had just returned. In contrast, the `finish` command resumes execution until the selected stack frame returns naturally.

See Also

`finish (gdb mode only)`
`pop (idb mode only)`

return (idb mode only)

Continue execution until the current or specified function returns.

Syntax

```
return [function_name]
```

Parameters

function_name	The function until which you want to continue execution.

Description

This command continues execution until the current, or specified, function returns. If you do not specify a function name, this command continues execution of the current function until it returns to its caller.

Specify a function name to continue the execution until control is returned to the specified function. The function must be active on the call stack.

This command is sensitive to the user's location in the call stack. Suppose function A calls function B, which calls function C. Execution has stopped in function C, and you entered the `up` command, so you are now in function B, at the point where it called function C. Using the `return` command here returns you to function A, at the point where function A called function B. Functions B and C will have completed execution.

Example

In this example the return command causes the user routine `append` to complete and return to the caller. At that point, the debugger returns control to the user.

```
(idb) cont
[1] stopped at [void List<Node>::append(class Node* const):151
0x0804ae6d]
151 Node* currentNode = _firstNode;
(idb) return
stopped at [int main(void):195 0x080518c8]
195 nodeList.append(new IntNode(3)); {static int somethingToReturnTo;
somethingToReturnTo++; }
```

See Also

finish (gdb mode only)

reverse-search (gdb mode only)

Search backward in the source for a string or repeat last search.

Syntax

```
reverse-search [string]
```

Parameters

string	The character string to search for.

Description

This command searches backward, starting at the current position, in the current source file for the specified character string. If you do not specify *string*, the debugger uses the string of the most recent search.

The debugger interprets the rest of the line to be the search string, so you do not need to quote the string. The debugger executes alias expansion on whatever precedes this command on the same line, possibly changing the search string.

When the debugger finds a match, it lists the line number and the line. That line becomes the starting point for any further searches, or for a `list` command.

Example

```
(idb) reverse-search append
145 void List<NODETYPE>::append(NODETYPE* const node)
(idb) reverse-search
65 void append (NODETYPE* const node);
```

See Also

forward-search (gdb mode only)
search (gdb mode only)

run

Run the debuggee program.

Syntax

`run [args] [IO_redirection]`

Parameters

args	The arguments to pass to the debuggee.

IO_redirection	Enables you to change `stdin`, `stdout`, and `stderr`, which are otherwise inherited from the debugger process.
	You can enter the following values:
	`< filename`
	Redirect `stdin`
	`> filename`
	Redirect `stdout`
	`1> filename`
	Redirect `stdout`
	`2> filename`
	Redirect `stderr`
	`>& filename`
	Redirect `stdout` and `stderr`
	`1> filename 2> filename`
	Redirect `stdout` and `stderr` to different files

Description

This command runs the debuggee, creating a process executing the loaded program. If you do not specify any arguments, the debugger uses default arguments. Default arguments are specified by the previous `run` command with arguments.

The debugger breaks up the argument string into words, and supports several shell features, including tilde (`~`) and environment variable expansion, wildcard substitution, single quote (`'`), double quote (`"`), and single character quote (`\`).

The debugger sets up `argc` and `argv` based on the argument list in the same way the shell does, where `argv[0]` is always the image run. For example, if you enter `run a b c`, then `argc` is 4, and `argv` is `{"debuggee", "a", "b", "c"}`.

GDB Mode:

You can also specify arguments using the `set args` command. To view default arguments, use the `show args` command.

Examples

```
(idb) run
(idb) run -s > prog.output
```

See Also

file (gdb mode only)
load (idb mode only)
rerun (idb mode only)
set args (gdb mode only)
show args (gdb mode only)

rwatch (gdb mode only)

Set a read watchpoint on the specified expression.

Syntax

`rwatch` *`expr`*

Parameters

`expr`	The expression on which to set the watchpoint.

Description

This command sets a read watchpoint on the specified expression. When the debuggee reads the value of the specified expression or writes to it, it stops.

Watchpoints are also referred to as *data breakpoints*.

See Also

awatch (gdb mode only)
watch (gdb mode only)
watch (idb mode only)

search (gdb mode only)

Search forward in the source for a string or repeat last search.

Syntax

`search [string]`

Parameterss

string	The character string to search for

Description

This command is a synonym for `forward-search`.

See Also

forward-search (gdb mode only)
reverse-search (gdb mode only)

set (idb mode only)

Set a debugger variable to a value or show all debugger variables.

Syntax

```
set [ variable = expr ]
```

Parameters

variable	A debugger variable, memory address, or expression that is accessible according to the scope and visibility rules of the language.
expr	The new definition of *variable*. This expression can be any expression that is valid in the current context.

Description

This command sets a debugger variable, memory address, or expression that is accessible according to the scope and visibility rules of the language of the debuggee. Alternatively, this command displays a list of all debugger variables and their values.

To set a debugger variable, enter this command followed by a variable name, an equal sign, and a definition. Enclose string definitions in quotes.

To display the definitions of all debugger variables, enter this command without any parameters.

To display the definitions of a single debugger variable, use the `print` command.

To delete one or all debugger variables, use the `unset` command.

To delete one or all environment variables, use the `unsetenv` command (not the `unset` command).

Enter `help $variable` for a list of all predefined debugger variables.

Example

```
(idb) print $givedebughints
0
(idb) set $givedebughints = "gdb"
(idb) print $givedebughints
1
```

See Also

set variable (gdb mode only)

show convenience (gdb mode only)
unset (idb mode only)

set args (gdb mode only)

Specify arguments for the debuggee program.

Syntax

`set args [arguments] [IO_redirection]`

Parameters

arguments	The arguments to pass to the debuggee.

IO_redirection	Enables you to change `stdin`, `stdout`, and `stderr`, which are otherwise inherited from the debugger process.
	You can enter the following values:
	`< filename`
	Redirect `stdin`
	`> filename`
	Redirect `stdout`
	`1> filename`
	Redirect `stdout`
	`2> filename`
	Redirect `stderr`
	`>& filename`
	Redirect `stdout` and `stderr` to a single file
	`1> filename 2> filename`
	Redirect `stdout` and `stderr` to different files

Description

This command specifies arguments for the debuggee. If the `run` command does not specify any arguments, the debuggee uses the arguments from the previous run command or arguments that you set with the `set args` command.

If you do not include any parameters, the debugger sets the argument list to null.

The `set args` command does not affect processes currently running. New arguments affect only the next run.

To view default arguments, use the `show args` command.

Example

```
(idb) set args -s > prog.output
```

```
(idb) show args
Argument list to give program being debugged when it is started is "-s >
prog.output".
```

See Also

run
show args (gdb mode only)

set confirm (gdb mode only)

Switch confirmation requests on or off.

Syntax

```
set confirm {on|off}
```

Parameters

`on`	Turns on confirmation requests.
`off`	Turns off confirmation requests.

Description

This command switches confirmation requests for various commands on or off.

set editing (gdb mode only)

Enable or disable Emacs*-like control characters.

Syntax

```
set editing {on|off}
```

Parameters

`on`	Enable Emacs*-like control characters.
`off`	Disable Emacs*-like control characters.

Description

This command enables or disables Emacs*-like control characters in the debugger. It is not possible to use vi*-like commands in IDB.

In the GUI console mode, this functionality is disabled by default. In the command-line interface, it is enabled by default.

Example

```
(idb) set editing on
(idb) show editing
Editing of command lines as they are typed is on.
```

See Also

show editing (gdb mode only)

set environment (gdb mode only)

Set an environment variable to a value.

Syntax

```
set environment name [ value ]
```

Parameters

name	The name of an environment variable.
value	The value for the environment variable.

Description

This command sets an environment variable to a value you specify.

To show the value of an environment variable, use `show environment`.

To remove an environment variable, use `unset environment`.

The environment commands have no effect on the environment of any currently running process. The environment commands do not change or show the environment variables of the debugger or of the current process. They only affect the environment variables that will be used when a new process is created.

You can set and unset environment variables for processes created in the future to set up an environment different from the environment of the debugger and of the shell from which the debugger was invoked. When set, the environment variables apply to all new processes you debug.

See Also

show environment (gdb mode only)
unset environment (gdb mode only)
export (idb mode only)
setenv (idb mode only)

set height (gdb mode only)

Set the height of the screen.

Syntax

```
set height num
```

Parameters

num	The screen height in lines.

Description

This command sets the height of the screen to *num* lines high.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the **Console** window in the GUI.

Screen height determines how many lines of output the debugger prints without pausing. When the debugger prints a large amount of output, the output may scroll out of site. You can use this command to set the number of lines of output that the debugger prints at one time.

After printing *num* lines of output, the debugger pauses. To continue printing output, press Enter. By default, *num* = 0, causing the debugger to print all output without pausing.

You can also specify how many columns the debugger prints before wrapping its output using `set width`.

To show the current height, use `show height`.

Example

```
(idb) set height 10
(idb) show height
Number of lines idb thinks are in a page is 10
(idb) set height 0
(idb) show height
Number of lines idb thinks are in a page is 0
```

See Also

set width (gdb mode only)
show height (gdb mode only)

set history save

Switch command-line history on or off.

Syntax

```
set history save [{on|off}]
```

Parameters

`on`	Switches on command-line history.
`off`	Switches off command-line history.

Description

This command switches command-line history on or off.

See Also

"Viewing the Command History" in Chapter 5
`set history size`
`show commands (gdb mode only)`

set history size

Specify the size of the command-line history.

Syntax

```
set history size num
```

Parameters

num	The number of lines in the command-line history.

Description

This command sets the size of the command history. The default size is that of the environment variable `HISTSIZE`. If `HISTSIZE` is not set, the default value is 256.

See Also

"Viewing the Command History" in Chapter 5
`set history save`
`show commands (gdb mode only)`

set language (gdb mode only)

Set the source language.

Syntax

```
set language name
```

Parameters

name — The source language to set.

Possible values are:

- `c`
- `c++`
- `fortran`
- `auto` (Default)

Description

This command sets the current source language.

By default, the compiler sets the source language of the debugger, and the debugger parses expressions the same way in the debugger interface and in the debuggee.

You may want to set the debugger interface language to be different from the source language. For example, if you are debugging a Fortran program and want to see where a pointer in a register actually points, you can switch to C syntax to do the cast `("p *(int *)$r4")`, which is more difficult to express in Fortran.

When you set the language manually and then step or continue the debuggee, thereby creating a new context, the debugger sets the language back.

Example

```
(idb) set language c++
(idb) show language
The current source language is "c++"
```

See Also

show language (gdb mode only)

set listsize (gdb mode only)

Set the default number of source lines for the list command to display.

Syntax

```
set listsize num
```

Parameters

num	The default number of source lines that the list command should display.

Description

This command sets the default number of source lines for the list command to display.

Example

```
(idb) set listsize 10
(idb) list
79
80                          // To sort the array.
81                          array4[a][b] = array4[c][d];
82
83                          // Set a breakpoint to watch the array.
84                          array4[c][d] = help;
85                      }
86                  }
87              }
88          }
(idb)
```

See Also

list
show listsize (gdb mode only)

set max-user-call-depth (gdb mode only)

Set a limitation on the number of recursion levels for user call depth.

Syntax

```
set max-user-call-depth num
```

Parameters

num	The maximum number of recursion levels.

Description

This command sets the maximum number of recursion levels a user-defined command may have. If the number of recursion levels in a user-defined command exceeds *num*, the debugger assumes an infinite recursion and aborts the command.

See Also

"User-defined Commands" in Chapter 5
define (gdb mode only)
show max-user-call-depth (gdb mode only)

set output-radix (gdb mode only)

Set the default numeric base for numeric output.

Syntax

```
set output-radix base
```

Parameters

base	The default base for numeric output. Possible values, listed in decimal base, are: • 8 • 10 • 16

Description

This command sets the default numeric base in which the debugger displays numeric output. The same rules apply for specifying the base as do with the `set input-radix` command.

Example

```
(idb) set output-radix 010
Output radix now set decimal 8, hex 8, octal 10.
(idb) show output-radix
Default output radix for printing of values is 8.
```

See Also

show output-radix (gdb mode only)

set print address (gdb mode only)

Set the debugger's default to either print or not print the value of a pointer as an address.

Syntax

```
set print address [ on | off ]
```

Parameters

`on`	Show an address value for pointers. This is the default value.
`off`	Hide an address value for pointers.

Description

This command sets the debugger's default to either print or not print the value of a pointer as an address.

The debugger shows this information by default.

This information may include the location of stack traces, breakpoints, structure and pointer values.

See Also

`show print address (gdb mode only)`

set print elements (gdb mode only)

Set a limit on the number of array elements to print.

Syntax

```
set print elements num
```

Parameters

num	The number of elements to print. The default value is 200.

Description

This command sets a limit on the number of array elements to print, which may be useful in a case where the debugger is printing a large array. This limit also applies to the number of characters the debugger will print when printing the value of a char * variable.

If you set *num* to zero, there is no limit on the number of elements.

Example

```
(idb) p pc
$1 = (char *) 0x80485b8 "1234"
(idb) set prin ele 2
(idb) p pc
$2 = (char *) 0x80485b8 "12"...
(idb)
```

See Also

show print elements (gdb mode only)

set print repeats (gdb mode only)

Limit the number of consecutive, identical array elements the debugger prints.

Syntax

```
set print repeats threshold
```

Parameters

threshold	The maximum number of consecutive, identical array elements the debugger prints. The default value is 10

Description

This command limits the number of consecutive, identical array elements the debugger prints. When the number of such elements exceeds *threshold*, instead of printing the elements, the debugger prints `repeats n times`, where *n* is the number of repetitions.

When *threshold* is `0`, the debugger prints all consecutive, identical array elements.

Example

```
(idb) p pBig
$1 = "01111121111333333333", '1' <repeats 40 times>
(idb) set print repe 2
(idb) p pBig
$2 = "0", '1' <repeats 5 times>, "2", '1' <repeats 5 times>, '3' <repeats
9 times>, '1' <repeats 40 times>
(idb)
```

See Also

show print repeats (gdb mode only)

set print static-members (gdb mode only)

Print static members when showing a C++ object.

Syntax

```
set print static-members [on | off]
```

Parameters

`on`	The debugger prints static members. This is the default.
`off`	The debugger does not print static members.

Description

This command enables or disables printing static members when showing a C++ object.

Example

```
(idb) set print stat off
(idb) p *jb
$3 = {JBfoo = 1}
(idb) set print stat on
(idb) p *jb
$4 = {JBfoo = 1, static yoyo = 99}
(idb)
```

See Also

show print static-members (gdb mode only)

set prompt (gdb mode only)

Set a new string for the debugger prompt.

Syntax

```
set prompt prompt
```

Parameters

prompt	The new prompt. The default debugger prompt is `(idb)`.

Description

This command sets a new string for the debugger prompt.

If *prompt* contains spaces or special characters, enclose the parameter in quotes ("").

You also can specify a debugger prompt when you start the debugger from a shell with the `-prompt` option. For example:

```
% idb -prompt ">> "
>> quit
```

You can also change the prompt by setting the `$prompt` debugger variable. For example:

```
(idb) set $prompt = "newPrompt>> "
newPrompt>>
```

To see the current debugger prompt, use the `show prompt` command.

Example

```
(idb) set prompt (gdb mode)
(gdb mode) show prompt
idb's prompt is "(gdb mode) ".
(gdb mode)
```

There is a space at the end of the first line of the example above. If the space is missed, the result will be as follows:

```
(idb) set prompt (gdb mode)
(gdb mode)show prompt
idb's prompt is "(gdb mode)".
(gdb mode)
```

See Also

show prompt (gdb mode only)

set substitute-path (gdb mode only)

Set a substitution rule for finding source files.

Syntax

```
set substitute-path from-path to-path
```

Parameters

from-path	The path to be replaced.
to-path	The new path.

Description

This command sets a substitution rule for finding source files.

See Also

map source directory (idb mode only)
unset substitute-path (gdb mode only)
Specifying Source Path Substitution Rules

set variable (gdb mode only)

Set a debugger variable to a value.

Syntax

```
set variable variable = [expression]
```

Parameters

variable	The variable to set. If *variable* starts with a dollar sign ($) then it is either a predefined register name or a debugger variable, either a predefined variable or a user variable. If *variable* does not start with a dollar sign ($), it is a variable in the program.
expression	The value for the variable.

Description

This command sets the values of a debugger variable, memory address, or expression that is accessible according to the scope and visibility rules of the language. The *expression* can be any expression that is valid in the current context.

The `set variable` command evaluates the specified expression. If the expression includes the assignment operator (=), the debugger evaluates that operator, as it does with all operators in expressions, and assigns the new value. The only difference between the `set variable` and the `print` commands is that `set variable` does not print anything, while print assigns the new value and displays the new value of the variable.

If you do not specify *expression*, debugger variables are set to `void`, while program variables do not change.

You can omit the keyword `variable` if the beginning of *expression* is unambiguous to the debugger. For example, if *expression* begins with the string `height`, the debugger interprets the command as the `set height` command.

For C++, use the `set variable` command to modify static and object data members in a class, and variables declared as reference types, type `const`, or type `static`. You cannot change the address referred to by a reference type, but you can change the value at that address.

Do not use the `set variable` command to change the PC. When you change the PC, no adjustment to the contents of registers or memory is made. Because most instructions change registers or memory in ways that can impact the meaning of the application,

changing the PC is very likely to cause your application to do incorrect calculations and arrive at the wrong answer. Access violations and other errors and signals may result from changing the value in the PC.

Example

The following example shows how to deposit the value `5` into the data member `_data` of a C++ object:

```
(idb) print node->_data
$2 = 2
(idb) set variable node->_data = 5
(idb) print node->_data
$3 = 5
```

The following example shows how to change the value associated with a variable and the value associated with an expression:

```
(idb) print *node
$6 = {<IntNode> = {<Node> = {_nextNode = 0x0}, _data = 5}, _fdata =
12.345}
(idb) set variable node->_data = -32
(idb) set variable node->_fdata = 3.14 * 4.5
(idb) set variable node->_nextNode = _firstNode
(idb) print *node
$7 = {<IntNode> = {<Node> = {_nextNode = 0x805c4e8}, _data = -32}, _fdata
= 14.13}
```

You can use the `set variable` command to alter the contents of memory specified by an address as shown in the following example:

```
(idb) set variable $address = &(node->_data)
(idb) print $address
$11 = (int *) 0x805c500
(idb) print *(int *)($address)
$12 = -32
(idb) set variable *(int *)($address) = 1024
(idb) print *(int *)($address)
$13 = 1024
```

See Also

assign (idb mode only)

print
set (idb mode only)
show convenience (gdb mode only)

set width (gdb mode only)

Set the width of the screen.

Syntax

```
set width num
```

Parameters

num	The screen width in characters.

Description

This command sets the width of the screen to *num* characters wide.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the **Console** window in the GUI.

Screen width determines how many characters of output the debugger prints without wrapping. When the debugger prints a large amount of output, the output may scroll out of site. You can use this command to set the number of characters of output that the debugger prints before wrapping to the next line.

You can also specify how many lines the debugger prints before pausing its output using `set height`.

To show the current width, use `show width`.

Example

```
(idb) set width 40
(idb) show width
Number of characters idb thinks are in a line is 40
(idb) set width 0
(idb) show width
Number of characters idb thinks are in a line is 0
```

See Also

set height (gdb mode only)
show width (gdb mode only)

setenv (idb mode only)

Set the value of an environment variable.

Syntax

```
setenv [ name value ]
```

Parameters

name	The variable for which you want to set the value.
value	The value for the variable.

Description

This command sets the value of an environment variable when you include *name* and *value*, or lists all environment variables when you do not include any parameters.

`setenv` is similar to `export`, except that `export` requires the equal sign to set a value, while `setenv` does not.

This command has no effect on the environment of any currently running process. This command does not change or show the environment variables of the debugger or of the current process. It only affects the environment variables that will be used when a new process is created.

You can set and unset environment variables for processes created in the future to set up an environment different from the environment of the debugger and from the shell that invoked the debugger. When set, the environment variables apply to all new processes you debug.

There is no command to return environment variables to their initial state.

To print all environment variables, use `printenv`, `setenv`, or `export`.

To print a single environment variable, use `printenv`.

To unset an environment variable, use `unsetenv`.

Example

```
(idb) printenv TOOLDIRECTORY
Error: Environment variable 'TOOLDIRECTORY' was not found in the
environment.
(idb) setenv TOOLDIRECTORY /home/user/examples/tools
(idb) printenv TOOLDIRECTORY
TOOLDIRECTORY=/home/user/examples/tools
```

See Also

export (idb mode only)
printenv (idb mode only)
unsetenv (idb mode only)
set environment (gdb mode only)

sh (idb mode only)

Execute a shell command.

Syntax

```
sh string
```

Parameters

string	The command to execute.

Description

This command executes a call to the operating system's `system` function. For more information on this function, see the man page for system: `man 3 system`.

When using the Console window in the GUI, the shell output appears in the shell window that invoked the debugger.

Example

The following examples are based on the command-line debugger, not on the GUI.

```
(idb) sh uname -s
Linux
(idb)
```

To execute more than one command at the shell, spawn a shell and enter commands, as shown in the following example:

```
(idb) sh bash -f
% ls out
out
% ls *.b
recio.b
stdio.b
% exit
(idb)
```

See Also

shell (gdb mode only)

shell (gdb mode only)

Execute a shell command.

Syntax

```
shell string
```

Parameters

string	The command to execute.

Description

This command executes a call to the operating system's `system` function. This function is documented in `system(3)`.

When using the Console window in the GUI, the shell output appears in the shell window that invoked the debugger.

Example

The following examples are based on the command-line debugger, not on the GUI.

```
(idb) sh uname -s
Linux
(idb)
```

To execute more than one command at the shell, spawn a shell and enter commands, as follows:

```
(idb) shell bash --norc
$ ls out
out
$ ls *.b
recio.b
stdio.b
$ exit
(idb)
```

See Also

sh (idb mode only)

show aggregated message

Print the specified aggregated messages.

Syntax

```
show aggregated message [ {all | msgs} ]
```

Parameters

msgs	A list of comma-separated, aggregated message IDs. The debugger assigns each aggregated message a unique integer ID when it first displays the ID.

Description

This command prints the specified aggregated messages, which is useful when debugging parallel applications.

The root debugger collects the outputs from the leaf debuggers and presents you with an aggregated output. In most cases, this aggregation works fine, but it can be an impediment if you want to know the exact output from certain leaf debuggers. To remedy this, the debugger assigns a unique number, called a message ID, to each aggregated message and saves the message in the message ID list.

If you specify a list of message IDs, the debugger displays the aggregated messages with these IDs.

If you specify `all`, IDB displays all the aggregated messages in the list.

If you specify nothing, the debugger shows the most recently added message.

See Also

expand aggregated message (idb mode only)

show architecture (gdb mode only)

Show the current architecture.

Syntax

```
show architecture
```

Parameters

None.

Description

This command shows the current architecture.

show args (gdb mode only)

Show arguments and input and output redirections.

Syntax

```
show args
```

Parameters

None.

Description

This command shows the default arguments and it shows input and output redirections for the debuggee. To set argument and input and output redirections, use `set args`.

See Also

`set args (gdb mode only)`

show commands (gdb mode only)

Print commands in history.

Syntax

```
show commands [num]
```

Parameters

num	The number of commands to print. By default, the values is set to 10.

Description

This command lists the last *num* commands in the debugger's command history.

See Also

"Viewing the Command History" in Chapter 5
set history save
set history size

show condition (idb mode only)

List information about pthreads condition variables.

Syntax

```
show condition
```

Parameters

None.

Description

This command lists information about pthreads condition variables.

show convenience (gdb mode only)

Show a list of debugger variables and their values.

Syntax

```
show convenience
```

Parameters

None.

Description

This command displays a list of all debugger variables and their values.

See Also

set variable (gdb mode only)
set (idb mode only)

show directories (gdb mode only)

Show the list of source directories to search.

Syntax

```
show directories
```

Parameters

None.

Description

This command lists the current source directories.

Example

```
(idb) directory
Source directories searched: $cdir:$cwd
(idb) directory aa:cc:dd
Source directories searched: aa:cc:dd:$cdir:$cwd
(idb) show directory
Source directories searched: aa:cc:dd:$cdir:$cwd
```

See Also

"Specifying Source Directories" in Chapter 2
"Specifying Source Path Substitution Rules" in Chapter 2
directory (gdb mode only)
use (idb mode only)

show editing (gdb mode only)

Show whether command line editing is on or off.

Syntax

```
show editing
```

Parameters

None.

Description

This command shows whether command line editing is on or off.

Example

```
(idb) set editing on
(idb) show editing
Editing of command lines as they are typed is on.
```

See Also

set editing (gdb mode only)

show environment (gdb mode only)

Show one or all environment variables.

Syntax

```
show environment [name]
```

Parameters

name	The environment variable to show.

Description

This command shows one or all environment variables and their values.

If you do not specify *name*, the debugger displays all environment variables with their values.

Example

```
(idb) show environment USER
USER=hal
```

See Also

set environment (gdb mode only)
export (idb mode only)
printenv (idb mode only)

show height (gdb mode only)

Show the height of the screen.

Syntax

```
show height
```

Parameters

None.

Description

This command shows the height of the screen in lines.

To set the height, use `set height`.

See Also

`set height (gdb mode only)`

show language (gdb mode only)

Show the current source language.

Syntax

```
show language
```

Parameters

None.

Description

This command shows the current source language.

To set the current source language, use `set language`.

Example

```
(idb) set language c++
(idb) show language
The current source language is "c++"
```

See Also

set language (gdb mode only)

show listsize (gdb mode only)

Show the default number of lines for the list command.

Syntax

```
show listsize
```

Parameters

None.

Description

This command shows the default number of lines the debugger lists when you use the `list` command.

Example

```
(idb) show listsize
Number of source lines idb will list by default is 10.
```

See Also

list
set listsize (gdb mode only)

show lock (idb mode only)

List information about OpenMP* locks.

Syntax

```
show lock name,…
```

Parameters

name	The name of the lock.

Description

This command lists information about one or more OpenMP* locks.

show max-user-call-depth (gdb mode only)

Show the maximum recursion level for user-defined commands.

Syntax

```
show max-user-call-depth
```

Parameters

None.

Description

This command shows the maximum number of recursion levels a user-defined command may have.

See Also

"User-defined Commands" in Chapter 5
define (gdb mode only)
set max-user-call-depth (gdb mode only)

show mutex (idb mode only)

Show information about pthreads mutexes.

Syntax

```
show mutex [ [mutex_id_list [ with state == locked ]]
```

Parameters

mutex_id_list A list of mutex identifiers.

Description

This command shows information about currently available pthreads mutexes.

If you supply one or more mutex identifiers, the debugger displays information about only those mutexes that you specify, provided that the list matches the identity of currently available mutexes.

If you omit the mutex identifier specification, the debugger displays information about all mutexes currently available.

Use `show mutex with state == locked` to display information exclusively about locked mutexes.

show openmp thread tree (idb mode only)

Display the threads in the process in a tree format.

Syntax

```
show openmp thread tree
```

Parameters

None.

Description

This command is equivalent to `idb info openmp thread tree`.

See Also

idb info openmp thread tree (gdb mode only)
show team (idb mode only)

show output-radix (gdb mode only)

Show the default numeric base for numeric output.

Syntax

```
show output-radix
```

Parameters

None.

Description

This command shows the default numeric base in which the debugger displays numeric output.

Example

```
(idb) set output-radix 010
Output radix now set decimal 8, hex 8, octal 10.
(idb) show output-radix
Default output radix for printing of values is 8.
```

See Also

set output-radix (gdb mode only)

show print address (gdb mode only)

Show whether addresses are set to be printed.

Syntax

```
show print address
```

Parameters

None.

Description

This command shows whether addresses are printed when printing pointers.

See Also

set print address (gdb mode only)

show print elements (gdb mode only)

Show the maximum number of array elements the debugger is set to print.

Syntax

```
show print elements
```

Parameters

None.

Description

This command shows the maximum number of array elements the debugger is set to print. If the number is 0, there is no limit.

See Also

set print elements (gdb mode only)

show print repeats (gdb mode only)

Show the the current threshold of repeated identical elements that the debugger is set to print.

Syntax

```
show print repeats
```

Parameters

None.

Description

This command shows the current threshold of repeated identical elements that the debugger is set to print.

See Also

set print repeats (gdb mode only)

show print static-members (gdb mode only)

Show the current status of the printing of static class members.

Syntax

```
show print static-members
```

Parameters

None.

Description

This command shows the current status of the printing of static class members.

See Also

set print static-members (gdb mode only)

show process (idb mode only)

List process information.

Syntax

```
show process [ {all | *} ]
```

Parameters

`all | *`	Instructs the debugger to show all processes.

Description

This command shows information for the current debuggee process, if you do not specify any parameter, or all processes, if you specify either `all` or `*`.

Example

```
(idb) show process
Current Process: 127.0.0.1:29573 (/home/hal/example_ia/control_icc_9.0)
paused.
```

See Also

process (idb mode only)
show process set

show process set

List information about one or all process sets.

Syntax

```
show process set [ {all|name} ]
```

Parameters

`all`	Lists information about all process sets.
name	The process set whose information you want to see.

Description

This command lists information about one or all process sets.

If you do not specify *name*, or if you specify `all`, the debugger displays all the process sets that are currently stored in debugger variables.

Example

```
(idb) set $set2 = [8:9, 5:2, 22:27]
`5:2' is not a legal process range. Ignored.
(idb) show process set $set2
$set2 = [8:9, 22:27]
(idb) show process set *
$set1 = [:7, 10, 15:20, 30:]
$set2 = [8:9, 22:27]
```

See Also

"Storing Process and Thread Sets in Debugger Variables" in Chapter 6
process (idb mode only)
show process (idb mode only)

show prompt (gdb mode only)

Show the current debugger prompt.

Syntax

```
show prompt
```

Parameters

None.

Description

This command shows the current debugger prompt. Use the `set prompt` command to set the debugger prompt.

Example

```
(idb) set prompt (gdb mode)
(gdb mode) show prompt
idb's prompt is "(gdb mode) ".
(gdb mode)
```

See Also

set prompt (gdb mode only)

show source directory (idb mode only)

List information about directory mappings.

Syntax

```
show [ all ] source directory [ directory ]
```

Parameters

`all`	Show mapping information of all descendants of *directory*.
directory	The directory for which you are seeking mapping information.

Description

This command displays the directory mapping information of *directory* and its child directories.

If you do not specify *directory*, the debugger displays the mapping information of all the source directories whose parent is not a source directory.

If you specify `all`, the debugger displays the mapping information of all the descendants of *directory*.

To set a directory mapping, use `map source directory`.

To unset a directory mapping, use `unmap source directory`.

See Also

map source directory (idb mode only)
unmap source directory (idb mode only)

show team (idb mode only)

List information about OpenMP* teams.

Syntax

```
show team [team_id,…]
```

Parameters

team_id	The team for which you want to list the information.

Description

This command lists information about live OpenMP* teams.

If you specify *team_id* one or more times, the debugger displays information about only those teams that you specify, provided that the list matches the identity of currently live teams.

If you do not specify *team_id*, the debugger displays information about all live teams.

See Also

show openmp thread tree (idb mode only)

show thread (idb mode only)

List information about a thread.

Syntax

```
show thread [ [thread_id,...] with state == thread_state ]
```

Parameters

thread_id — A thread ID. Specify one or more.

thread_state — Threads that you want to list are in the this state.

Valid state values for DEC threads:

- `ready`
- `blocked`
- `running`
- `terminated`
- `detached`

Valid state values for native threads:

- `stopped`
- `running`
- `terminated`

Description

This command lists all the threads known to the debugger. If you specify one or more thread identifiers, the debugger displays information about the threads that you specify, if the thread matches what you specified in the list.

If you do not specify *thread_id_list*, the debugger displays information for all threads.

Specify `with state == thread_state` to list threads that have specific characteristics, such as threads that are currently blocked.

Example

```
(idb) show thread 1,2,3
```

See Also

info threads (gdb mode only)

show user (gdb mode only)

Show the definition of one or all user-defined commands.

Syntax

```
show user [cmd]
```

Parameters

cmd	The user-defined command whose definition you want to show.

Description

This command shows the definition of one or all user-defined commands. If you specify *cmd*, the debugger displays the definition of that command. If you do not specify *cmd*, it displays the definitions of all user-defined commands.

See Also

"User-defined Commands" in Chapter 5
define (gdb mode only)

show values (gdb mode only)

Show ten values of the value history.

Syntax

```
show values [ {num|+} ]
```

Parameters

num	Show values centered on value *num*.
+	Start showing values after the last value printed.

Description

This command shows the last ten values in the value history.

If you specify *num*, the debugger shows the ten values centered around the value at the *num* place in the history.

If you specify +, the debugger shows the ten values in the history starting with the most recently printed value. For example, if the most recent printed value is $7, the debugger shows the ten values starting with $8.

If the value history does not contain enough values to print ten, the debugger prints the number of values it has in the value history. For example, if you do not specify *num* or +, and the debugger only has seven value, it shows seven values. If you specify +, and the value history only has seven values after the most recent one it printed, it shows those seven values.

show width (gdb mode only)

Show the width of the screen.

Syntax

```
show width
```

Parameters

None.

Description

This command shows the width of the screen in characters.

To set the width, use `set width`.

Example

```
(idb) set width 40
(idb) show width
Number of characters idb thinks are in a line is 40
(idb) set width 0
(idb) show width
Number of characters idb thinks are in a line is 0
```

See Also

set width (gdb mode only)

source

Execute commands from a batch file.

Syntax

```
source filename
```

Parameters

filename	The file from which to execute commands.

Description

This command specifies a file from which the debugger reads and executes a series of commands.

Alternatively, you can execute debugger commands when you invoke the debugger by creating an initialization file named `.idbrc` or `.dbxinit` on Linux* OS, or `idbinit.idb` and `idbsetup.idb` on a Microsoft* Windows* OS.

If you place commands in a file, you can execute them directly from the file rather than cutting and pasting them to the terminal. These commands can be nested, and as each comes to an end, reading resumes from where it left off in the previous file.

The following rules and guidelines apply to command files:

- Blank lines in command files do not repeat the last command, as opposed to blank lines entered directly from the prompt.
- Format the commands as if they were entered at the debugger prompt.
- Use the pound character (`#`) to create comments to format your scripts.
- When the debugger executes a command file, the value of the `$pimode` debugger variable determines whether the commands are echoed. If the `$pimode` variable is set to 1, commands are echoed. If *`$`*`$pimode` is set to 0, the default, commands are not echoed. The debugger output resulting from the commands is always echoed.

Example

The following example is a debugger script:

```
(idb) sh cat ../src/myscript
step
where 2
```

The following example shows how to execute the script:

```
(idb) run
```

```
[1] stopped at [int main(void):187 0x080516aa]
187 nodeList.append(newNode); {static int somethingToReturnTo;
somethingToReturnTo++; }
(idb) source ../src/myscript
stopped at [void List<Node>::append(class Node* const):148 0x0804ae5a]
148 if (!_firstNode)
>0 0x0804ae5a in
((List<Node>*)0xbfffa460)->List<Node>::append(node=0x805c500)
"src/x_list.cxx":148
#1 0x080516c2 in main() "src/x_list.cxx":187
```

See Also

"Configuring Default Startup Actions Using Initialization Files" in Chapter 2
playback input (idb mode only)
record (idb mode only)

status (idb mode only)

Print info on all breakpoints and tracepoints.

Syntax

```
status
```

Parameters

None.

Description

This command displays all currently existing breakpoints and their properties.

Example

```
(idb) status
#1 PC==0x08051603 in int main(void) "src/x_list.cxx":182 { stop }
#2 PC==0x0804ae5a in void List<Node>::append(class Node* const)
"src/x_list.cxx":148 { break }
#3 Access memory (write) 0xbfffdb00 to 0xbfffdb03 { stop }
```

See Also

delete (idb mode only)
disable
enable
info breakpoints (gdb mode only)
info watchpoints (gdb mode only)
stop every (idb mode only)

step

Step forward in source, into any function calls.

Syntax

```
step [expr]
```

Parameters

expr	A numeric expression.

Description

This command executes a line of source code. When the next line to be executed contains a function call, the debugger steps into the function and stops at the first executable statement.

If you specify *expr*, the debugger evaluates the expression as a positive integer that specifies the number of times to execute the `step` command. The expression can be any expression that is valid in the current context.

Example

In the following example, five `step` commands continue executing a C++ program:

GDB Mode:

```
(idb) list +0,+4
151 Node* currentNode = _firstNode;
152 while (currentNode->getNextNode())
153 currentNode = currentNode->getNextNode();
154 currentNode->setNextNode(node);
(idb) step
152 while (currentNode->getNextNode())
(idb) step
Node::getNextNode (this=0x805c500) at src/x_list.cxx:81
81 Node* Node::getNextNode() {return _nextNode; }
(idb) step
81 Node* Node::getNextNode() {return _nextNode; }
(idb) step
```

```
List<Node>::append (this=0xbfffcbe0, node=0x805c510) at
src/x_list.cxx:152
152 while (currentNode->getNextNode())
(idb) step
154 currentNode->setNextNode(node);
```

IDB Mode:

```
(idb) list $curline:4
> 151 Node* currentNode = _firstNode;
152 while (currentNode->getNextNode())
153 currentNode = currentNode->getNextNode();
154 currentNode->setNextNode(node);
(idb) step
stopped at [void List<Node>::append(class Node* const):152 0x0804ae75]
152 while (currentNode->getNextNode())
(idb) step
stopped at [class Node* Node::getNextNode(void):81 0x08051be5]
81 Node* Node::getNextNode() {return _nextNode; }
(idb) step
stopped at [class Node* Node::getNextNode(void):81 0x08051bec]
81 Node* Node::getNextNode() {return _nextNode; }
(idb) step
stopped at [void List<Node>::append(class Node* const):152 0x0804ae81]
152 while (currentNode->getNextNode())
(idb) step
stopped at [void List<Node>::append(class Node* const):154 0x0804aebf]
154 currentNode->setNextNode(node);
```

See Also

next
nexti
run
stepi

stepi

Step forward in assembler instructions, into any function calls.

Syntax

```
stepi [expr]
```

Parameters

expr	A numeric expression.

Description

This command executes a machine instruction. When the instruction contains a function call, the command steps into the function being called.

For multithreaded applications, use the `stepi` command to step the current thread one machine instruction while putting all other threads on hold.

If you specify *expr*, the debugger evaluates the expression as a positive integer that specifies the number of times to execute the `stepi` command. The expression can be any expression that is valid in the current context.

Example

The following example shows stepping by instruction (`stepi`). To see stepping over calls, see the example of the `next` command.

GDB Mode:

```
(idb) x /8i $pc
0x0804ae6d <append+25>: movlr 0x8(%ebp), %eax
0x0804ae70 <append+28>: movlr (%eax), %eax
0x0804ae72 <append+30>: movl %eax, -16(%ebp)
0x0804ae75 <append+33>: pushl %edi
0x0804ae76 <append+34>: movlr -16(%ebp), %eax
0x0804ae79 <append+37>: movl %eax, (%esp)
0x0804ae7c <append+40>: call 0x08051be2 <getNextNode>
0x0804ae81 <append+45>: addl $0x4, %esp
(idb) stepi
0x0804ae70 151 Node* currentNode = _firstNode;
(idb) x /1i $pc
```

```
0x0804ae70 <append+28>: movlr (%eax), %eax
(idb) stepi $count - 1
0x0804ae70 151 Node* currentNode = _firstNode;
(idb) x /1i $pc
0x0804ae70 <append+28>: movlr (%eax), %eax
(idb) stepi
0x0804ae72 151 Node* currentNode = _firstNode;
(idb) x /1i $pc
0x0804ae72 <append+30>: movl %eax, -16(%ebp)
```

IDB Mode:

```
(idb) $curpc/8i
void List<Node>::append(class Node* const): src/x_list.cxx
*[line 151, 0x0804ae6d] append(class Node* const)+0x19: movlr 0x8(%ebp),
%eax
[line 151, 0x0804ae70] append(class Node* const)+0x1c: movlr (%eax), %eax
[line 151, 0x0804ae72] append(class Node* const)+0x1e: movl %eax,
-16(%ebp)
[line 152, 0x0804ae75] append(class Node* const)+0x21: pushl %edi
[line 152, 0x0804ae76] append(class Node* const)+0x22: movlr -16(%ebp),
%eax
[line 152, 0x0804ae79] append(class Node* const)+0x25: movl %eax, (%esp)
[line 152, 0x0804ae7c] append(class Node* const)+0x28: call getNextNode
[line 152, 0x0804ae81] append(class Node* const)+0x2d: addl $0x4, %esp
(idb) stepi
stopped at [void List<Node>::append(class Node* const):151 0x0804ae70]
append(class Node* const)+0x1c: movlr (%eax), %eax
(idb) stepi $count - 1
stopped at [void List<Node>::append(class Node* const):151 0x0804ae70]
append(class Node* const)+0x1c: movlr (%eax), %eax
(idb) stepi
stopped at [void List<Node>::append(class Node* const):151 0x0804ae72]
append(class Node* const)+0x1e: movl %eax, -16(%ebp)
```

See Also

next

nexti
run
step

stop at (idb mode only)

Set a breakpoint at a line number or expression.

Syntax

```
stop [quiet] at expr [thread id {,...}][if cond] [commands]
```

Parameters

expr	A line number in source code or an expression, other than a function name.
id	A thread ID.
cond	A conditional expression.
commands	A list of debugger commands.

Description

This command sets a breakpoint on an expression that you specify with *expr*.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if cond`.

To run one or more commands upon hitting a breakpoint, specify *commands*.

Example

```
(idb) stop in main
[#1: stop in int main(void) ]

(idb) stop at 167
[#1: stop at "src/x_list.cxx":167]
(idb) run
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
(idb)
```

See Also

break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop every (idb mode only)
stop in (idb mode only)
stop pc (idb mode only)
stop variable (idb mode only)
stop memory (idb mode only)
stop signal (idb mode only)
stop unaligned (idb mode only)
stop every (idb mode only)

stop every (idb mode only)

Set a breakpoint on every function entry point or on every instruction.

Syntax

```
stop [quiet] every procedure entry [thread id {,...}][if cond] [commands]
stop [quiet] every instruction [thread id {,...}][if cond] [commands]
```

Parameters

id	A thread ID.
cond	A conditional expression.
commands	A list of debugger commands.

Description

This command sets a breakpoint on every entry point to a function in the program, or on every instruction in the program.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if` *cond*.

To run one or more commands upon hitting a breakpoint, specify *commands*.

A disadvantage of this command is that it establishes breakpoints for hundreds or even thousands of entry points about which you have little or no information. For example, if you use `stop every procedure entry` immediately after loading a program and then run it, the debugger will stop or trace over 100 entry points before reaching your main entry point. About the only thing that you can do if execution stops at most such unknown places is continue until some function relevant to your debugging is reached.

NOTE. This command can be very time consuming because the debugger searches your entire program—including all shared libraries that it references—and establishes breakpoints for every entry point in every executable image. This can also considerably slow execution of your program as it runs.

See Also

break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop at (idb mode only)
stop in (idb mode only)
stop memory (idb mode only)
stop pc (idb mode only)
stop signal (idb mode only)
stop unaligned (idb mode only)
stop variable (idb mode only)

stop in (idb mode only)

Set a breakpoint in a function.

Syntax

```
stop [quiet] [in] [all] funcname [thread id {,...}][if cond] [commands]
```

Parameters

funcname	Sets a breakpoint on the function of this name.
id	A thread ID.
cond	A conditional expression.
commands	A list of debugger commands.

Description

This command sets a breakpoint on a function named *funcname*. If you specify `all`, the debugger breaks on all functions with this name.

Whenever the debugger hits a breakpoint, the debugger suspends program execution and waits for a command from you.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if` *cond*.

To run one or more commands upon hitting a breakpoint, specify *commands*.

Example

```
(idb) stop in main
[#1: stop in int main(void) ]

(idb) stop at 167
[#1: stop at "src/x_list.cxx":167]
(idb) run
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
(idb)
```

See Also

break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop at (idb mode only)
stop every (idb mode only)
stop memory (idb mode only)
stop pc (idb mode only)
stop signal (idb mode only)
stop unaligned (idb mode only)
stop variable (idb mode only)

stop memory (idb mode only)

Set a breakpoint on a region in memory.

Syntax

```
stop [quiet] memory start-addr [, end-addr| :size] [access] [within
funcname] [thread id {,...}][if cond] [commands]
```

Parameters

id	A thread ID.
cond	A conditional expression.
commands	A list of debugger commands.
start-addr	The address at the start of the memory region.
end-addr	The address at the end of the memory region starting from *start-addr*.
size	The size of the memory region starting from *start-addr*.
funcname	The name of a function.
access	Possible values are: • `write` • `read` • `changed` This mode detects writes that change the contents of the memory. • `any` This mode detects both `read` and `write`. Default value: `write`

Description

This command sets a breakpoint on a region in memory that you specify. If you specify `within` *funcname*, program execution breaks only when the access occurs in the specified function.

start-addr is the address at the beginning of a memory region. This memory region is 8-bytes in size when you do not specify *end-addr* or *size*.

If you specify *size*, the memory region starts with *start-addr* and is *size*-bytes long.

If you specify *end-addr*, the memory region is from *start-addr* through *end-addr*, inclusive.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if` *`cond`*.

To run one or more commands upon hitting a breakpoint, specify *`commands`*.

See Also

`break (gdb mode only)`
`delete (idb mode only)`
`disable`
`enable`
`status (idb mode only)`
`stop in (idb mode only)`
`stop at (idb mode only)`
`stop pc (idb mode only)`
`stop variable (idb mode only)`
`stop signal (idb mode only)`
`stop unaligned (idb mode only)`
`stop every (idb mode only)`

stop pc (idb mode only)

Set a breakpoint when PC equals a specific address.

Syntax

```
stop [quiet] pc address [thread id {,...}][if cond] [commands]
```

Parameters

address	An address.
id	A thread ID.
cond	A conditional expression.
commands	A list of debugger commands.

Description

This command sets a breakpoint that stops program execution when PC equals an address that you specify.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if cond`.

To run one or more commands upon hitting a breakpoint, specify *commands*.

See Also

break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop in (idb mode only)
stop at (idb mode only)
stop variable (idb mode only)
stop memory (idb mode only)
stop signal (idb mode only)
stop unaligned (idb mode only)
stop every (idb mode only)

stop signal (idb mode only)

Set a breakpoint on a signal.

Syntax

```
stop [quiet] signal signal [, ...] [thread id {,...}][if cond] [commands]
```

Parameters

signal	One or more comma-separated signals.
id	A thread ID.
cond	A conditional expression.
commands	A list of debugger commands.

Description

This command sets a breakpoint on a signal. Program execution stops when it receives any of the signals that you specify.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if cond`.

To run one or more commands upon hitting a breakpoint, specify *commands*.

See Also

break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop in (idb mode only)
stop at (idb mode only)
stop pc (idb mode only)
stop variable (idb mode only)
stop memory (idb mode only)
stop unaligned (idb mode only)
stop every (idb mode only)

stop unaligned (idb mode only)

Set a breakpoint on unaligned accesses.

Syntax

```
stop [quiet] unaligned [thread id {,...}][if cond] [commands]
```

Parameters

id	A thread ID.
cond	A conditional expression.
commands	A list of debugger commands.

Description

This command sets a breakpoint that stops the debugger when program execution encounters an unaligned access.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if cond`.

To run one or more commands upon hitting a breakpoint, specify *commands*.

See Also

break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop in (idb mode only)
stop at (idb mode only)
stop pc (idb mode only)
stop variable (idb mode only)
stop memory (idb mode only)
stop signal (idb mode only)
stop every (idb mode only)

stop variable (idb mode only)

Set a breakpoint on a specific variable.

Syntax

```
stop [quiet] variable lvalue [access] [within funcname] [thread id
{,...}][if cond] [commands]
```

Parameters

lvalue	An expression that designates a memory location.
id	A thread ID.
cond	A conditional expression.
commands	A list of debugger commands.
funcname	The name of a function.
access	Possible values are: • `write` • `read` • `changed` This mode detects writes that change the contents of the memory. • `any` This mode detects both `read` and `write`. Default value: `write`

Description

This command sets a breakpoint on a variable that you specify. If you specify `within` *`funcname`*, program execution breaks only when the access occurs in the specified function.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if` *`cond`*.

To run one or more commands upon hitting a breakpoint, specify *`commands`*.

See Also

break (gdb mode only)
delete (idb mode only)
disable

enable
status (idb mode only)
stop in (idb mode only)
stop at (idb mode only)
stop pc (idb mode only)
stop memory (idb mode only)
stop signal (idb mode only)
stop unaligned (idb mode only)
stop every (idb mode only)

stopi (idb mode only)

Set a breakpoint at an instruction, or if a variable changes.

Syntax

```
stopi [traced_expression] [thread id ,...] [at address] [if cond]
stopi address [thread id ,...] [if cond]
```

Parameters

traced_expression	An expression that you want to trace.
id	A thread ID.
address	An address. When using the form `stopi address`, this value is an integer constant.
cond	A conditional expression.

Description

This command sets a breakpoint at an instruction or on a traced expression.

If you specify *traced_expression*, program execution stops when the value of the traced expression changes.

If you specify `if cond`, program execution stops when *cond* evaluates to true.

If you specify both *traced_expression* and `if cond`, program execution stops only if *cond* evaluates to true and the value of *traced_expression* has changed.

If you specify `at address`, program execution stops when it hits *address*.

If you specify both *traced_expression* and `at address`, program execution stops only if the variable has changed when the address is hit.

If you specify both `at address` and `if cond`, execution stops only if *cond* evaluates to true when the address is hit.

If you specify *traced_expression*, `at address` and `if cond`, execution stops only if the value of *traced_expression* has changed and if *cond* evaluates to true when the address is hit.

Specify the thread list to set tracepoints in specific threads. If you list one or more thread IDs, the debugger sets a tracepoint only in those threads you specify. If you do not specify a thread ID, the debugger sets a tracepoint in all the threads of the application.

The `stopi` command differs from the `stop` command in that the debugger checks the breakpoint set with the `stopi` command after executing each machine instruction. So using `stopi` affects debugger performance.

symbol-file (gdb mode only)

Load a symbol table from the specified executable file.

Syntax

```
symbol-file [filename]
```

Parameters

filename	The executable file from which to load the symbol table.

Description

This command loads the symbol table from the specified executable file.

filename provides the debugging information on the process running on the remote system. It does not need to be exactly the same file that is running on the remote system.

If *filename* is in the format for specifying a connection, *protocol*:*host*:*port*, then use the protocol and the port. Otherwise use the *filename* as a path to the serial device supporting the interface.

target core (gdb mode only)

Specify a core file as a target.

Syntax

```
target core filename
```

Parameters

filename	The filename of the target core file.

Description

This command specifies a core file to use as a target.

This command is the same as `core-file filename`.

See Also

core-file (gdb mode only)

target remote (gdb mode only)

Attach to a remote process.

Syntax

```
target remote [[protocol:]host]:port [filename]
```

Parameters

protocol	The connection protocol.
host	The host name.
port	The target port to connect.
filename	The name of the local copy of the file.

Description

This command only applies to remote debugging.

This command attaches the debugger to a remote process that is already running on the target.

After the remote server has loaded a program, use this command to connect to the remote process.

To load the debugging information from the file, use the `symbol-file` command.

See Also

attach
symbol-file (gdb mode only)

tbreak (gdb mode only)

Set a temporary breakpoint at specified location.

Syntax

```
tbreak { funcname | num }
```

Parameters

funcname	The name of a function.
num	The number of a source code line.

Description

This command ses a temporary breakpoint at the specified location, either a line number in source code, or a function.

This command differs from the `break` command in that the `tbreak` command creates a temporary breakpoint that is automatically removed after it stops program execution.

Example

```
(idb) tbreak main
```

See Also

break (gdb mode only)
commands (gdb mode only)
condition (gdb mode only)
disable
enable
ignore (gdb mode only)
info breakpoints (gdb mode only)
jump (gdb mode only)

thread

Show or change the current thread.

Syntax

```
thread [ID]
```

Parameters

ID	The identifier of the thread to which you want to switch.

Description

This command shows or changes the current thread. If you omit a thread identifier, the debugger shows the current thread. If you specify a thread identifier, the debugger makes that thread the current thread.

The debugger variable *$curthread* contains the thread identifier of the current thread. The *$curthread* value is updated when program execution stops or completes.

You can modify the current thread by assigning *$curthread* a valid thread identifier, which is equivalent to issuing the `thread ID` command. When there is no process or program, *$curthread* is set to 0.

Example

GDB Mode:

```
(idb) thread 2
* 2 Thread 1026 (LWP 19515) 0x804f8f6 in __sigsuspend from
/tmp/pthread_manythreads
```

IDB Mode:

```
(idb) thread 2
ID          STATE
*1          stopped
```

See Also

"$curthread" in Chapter 8

unalias (idb mode only)

Remove an alias.

Syntax

```
unalias alias_name
```

Parameters

alias_name	The name of the alias to be removed.

Description

This command removes the alias specified by *alias_name*.

Example

```
(idb) alias cs
alias cs is not defined
(idb) alias cs "stop at 186; run"
(idb) cs
[#1: stop at "x_list.cxx":186 ]
[1] stopped at [int main(void):186 0x120002420]
186 IntNode* newNode = new IntNode(1);
(idb) unalias cs
(idb)
```

See Also

alias (idb mode only)

undisplay (gdb mode only)

Remove the specified items from the display list.

Syntax

```
undisplay [ ID,… ]
```

Parameters

ID	The ID of the item to remove from display list.

Description

This command removes the specified items from the display list.

This command is equivalent to `delete display`.

See Also

`delete display (gdb mode only)`
`display (gdb mode only)` Includes info on display lists.
`disable display (gdb mode only)`
`enable display (gdb mode only)`
`info display (gdb mode only)`

unload (idb mode only)

Unload an image or a core file from the debugger.

Syntax

```
unload [ {filename|pid,…} ]
```

Parameters

filename	The executable file to unload.
pid	An integer constant representing the ID of the process to unload.

Description

This command unloads an image or a core file from the debugger.

Example

```
(idb) listobj
section Start Addr End Addr
-------------------------------------------------------------------------
/home/user/examples/x_list
.text 0x8048000 0x8056e3f
.data 0x8057000 0x805deeb
.bss 0x805deec 0x805dfb3
/lib/libdl-2.3.2.so
.text 0xb7386000 0xb7387dc3
.data 0xb7388dc4 0xb7388f53
.bss 0xb7388f54 0xb7388f73
/lib/tls/libc-2.3.2.so
.text 0xb7389000 0xb74b94f5
.data 0xb74ba500 0xb74bcfdb
.bss 0xb74bcfdc 0xb74bfa8b
/nfs/cmplr/icc-9.0.031/lib/libunwind.so.5
.text 0xb74c0000 0xb74c433f
.data 0xb74c5340 0xb74c5abb
.bss 0xb74c5abc 0xb74c5c1b
```

```
/nfs/cmplr/icc-9.0.031/lib/libcxa.so.5
.text 0xb74c6000 0xb74e62b3
.data 0xb74e7000 0xb74eed37
.bss 0xb74eed38 0xb74eeeaf
/nfs/cmplr/icc-9.0.031/lib/libcprts.so.5
.text 0xb74ef000 0xb758d933
.data 0xb758e000 0xb75b422f
.bss 0xb75b4230 0xb75b4c27
/lib/tls/libm-2.3.2.so
.text 0xb75b5000 0xb75d5dbf
.data 0xb75d6dc0 0xb75d6f43
.bss 0xb75d6f44 0xb75d6f8f
/lib/ld-2.3.2.so
.text 0xb75eb000 0xb75fffcf
.data 0xb7600000 0xb7600533
.bss 0xb7600534 0xb7600753
(idb) unload
(idb) listobj
Program is not active
```

See Also

load (idb mode only)

unmap source directory (idb mode only)

Remove a directory mapping.

Syntax

```
unmap source directory dirname
```

Parameters

dirname	The directory whose mapping will be removed.

Description

This commnad removes a directory mapping by mapping *dirname* back to itself. In other words, if *dirname* has been mapped to some other directory, this command restores its default mapping.

Example

```
(idb) show source directory
.
/home/user/examples/solarSystemSrc *=>
/home/user/examples/movedSolarSystemSrc
...
(idb) show source directory /home/user/examples/solarSystemSrc
/home/user/examples/solarSystemSrc *=>
/home/user/examples/movedSolarSystemSrc
/home/user/examples/solarSystemSrc/base_class_includes =>
/home/user/examples/movedSolarSystemSrc/base_class_includes
/home/user/examples/solarSystemSrc/derived_class_includes =>
/home/user/examples/movedSolarSystemSrc/derived_class_includes
/home/user/examples/solarSystemSrc/main =>
/home/user/examples/movedSolarSystemSrc/main
(idb) unmap source directory /home/user/examples/solarSystemSrc
(idb) show source directory /home/user/examples/solarSystemSrc
/home/user/examples/solarSystemSrc
/home/user/examples/solarSystemSrc/base_class_includes
/home/user/examples/solarSystemSrc/derived_class_includes
```

unrecord (idb mode only)

Stop recording debugger input, output, or both.

Syntax

```
unrecord {input|output|io}
```

Parameters

`input`	Stops logging input.
`output`	Stops logging output
`io`	Stops logging input and output.

Description

This command stops recording debugger input, output, or both.

To record, use the `record` command.

Example

```
(idb) record output myscript
(idb) stop in List<Node>::append
[#2: stop in void List<Node>::append(class Node* const)]
(idb) cont
[2] stopped at [void List<Node>::append(class Node* const):148
0x0804ae5a]
148 if (!_firstNode)
(idb) cont to 156
stopped at [void List<Node>::append(class Node* const):156 0x0804aed7]
156 }
(idb) unrecord output
```

See Also

record (idb mode only)

unset (idb mode only)

Delete the specified debugger variable.

Syntax

```
unset name
```

Parameters

name	The variable to delete.

Description

This command deletes the specified debugger variable.

Example

```
(idb) set $color="blue"
(idb) print $color
"blue"
(idb) unset $color
(idb) print $color
Symbol "$color" is not defined.
```

See Also

set (idb mode only)

unset environment (gdb mode only)

Delete the specified environment variable.

Syntax

```
unset environment [ name ]
```

Parameters

name	Environment variable to unset.

Description

This command deletes the specified environment variable, so that it is no longer part of the environment.

To assign an environment variable an empty value, use `set environment name = .`

If you do not specify *name*, the debugger deletes all environment variables.

See Also

set environment (gdb mode only)
unsetenv (idb mode only)

unset substitute-path (gdb mode only)

Unset a source directory substitution rule.

Syntax

```
unset substitute-path from-path
```

Parameters

from-path	The path you replaced with the `set substitute-path` command.

Description

This command unsets a source directory substitution rule. Specify the original path for which you created a substitution rule.

See Also

`set substitute-path (gdb mode only)`
Specifying Source Path Substitution Rules

unsetenv (idb mode only)

Delete the specified environment variable, or all.

Syntax

```
unsetenv {name|*}
```

Parameters

name	The environment variable to unset.
*	Unsets all environment variables.

Description

This command deletes a specific environment variable or all environment variables, so that they are no longer part of the environment.

To delete a specific environment variable, specify *name*.

To delete all environment variables, specify *.

To assign an environment variable an empty value, use `setenv name = .`

See Also

setenv (idb mode only)
unset environment (gdb mode only)

until (gdb mode only)

Run until a specific line.

Syntax

```
until [line]
```

Parameters

line	The line until which to run.

Description

This command continues the debuggee past the current line until the next source line in the current stack frame. Use this command to avoid single stepping through a loop more than once.

If you specify *line*, the debugger continues running until it either reaches the specified location, or the current stack frame returns.

See Also

advance (gdb mode only)
continue (gdb mode only)

unuse (idb mode only)

Remove the specified directories from the source path or set path to default.

Syntax

```
unuse [ { dirname,… | * } ]
```

Parameters

dirname	The directory to remove from source path.
*	Sets path to default.

Description

This command removes entries from the list of source directories that the debugger uses to search for source and script files when opening an executable file.

To add entries to the list, use `use`.

If you do not specify any directories, this command sets the search list to the default, which is the home directory, the current directory, and the directory containing the executable file.

If you specify any directory names, the debugger removes them from the search list.

If you specify an asterisk (`*`), the debugger removes all directories from the search list.

Example

```
(idb) unuse aa
Directory search path for source files:
. ../src /home/user/examples bb cc
(idb) unuse aa
aa not in the current source path
Directory search path for source files:
. ../src /home/user/examples bb cc
(idb) unuse bb cc
Directory search path for source files:
. ../src /home/user/examples
(idb) unuse *
Directory search path for source files:
(idb) unuse
```

```
Directory search path for source files:
. ../src /home/user/examples
```

See Also

show source directory (idb mode only)
use (idb mode only)

up

Move a specific number of frames up the stack and print them.

Syntax

```
up [ num ]
```

Parameters

num	A numeric expression of non-negative value. The default value is 1.

Description

This command moves to the stack frame *num* levels above the current frame and then prints those frames. The default value for *num* is 1.

If the specified number of levels exceeds the number of active calls on the stack in the specified direction, the debugger issues a warning message and the call frame does not change.

When the current call frame changes, the debugger displays the source line corresponding to the last instruction executed in the function executing the selected call frame.

Example

GDB Mode:

```
(idb) up 2
#2  0x08051a3c in main () at src/x_list.cxx:203
203     nodeList.print();
(idb) list 200,+5
200     CompoundNode* cNode2 = new CompoundNode(10.123, 5);
201     nodeList.append(cNode2); {static int somethingToReturnTo;
somethingToReturnTo++; }
202
203     nodeList.print();
204 }
```

See Also

down
down-silently (gdb mode only)
up-silently (gdb mode only)

up-silently (gdb mode only)

Move a specific number of frames up the stack but do not print them.

Syntax

```
up-silently [num]
```

Parameters

num	A numeric expression of non-negative value

Description

This command moves to the stack frame *num* levels above the current frame. The default value for num is 1. This command is the same as up, except that it does not display the new frame.

If the specified number of levels exceeds the number of active calls on the stack in the specified direction, the debugger issues a warning message and the call frame does not change.

See Also

down
down-silently (gdb mode only)
up

use (idb mode only)

Add a directory to the source path, or show directories in the source path.

Syntax

```
use [ dirname … ]
```

Parameters

dirname	The path of the directory to add to the source path.

Description

This command adds directories to the list of source directories that the debugger uses to search for source and script files when opening an executable file.

If you do not specify *dirname*, the debuggee lists the directories in which the debugger searches for source code files.

If you specify *dirname*, the debugger searches source code files in that directory, and appends *dirname* to the list of source directories, or it replaces the list, depending on the value of the `$dbxuse` debugger variable: When `$dbxuse` is zero, the debugger appends. Otherwise it replaces. The default value of `$dbxuse` is 0.

Alternatively, you can specify the `-I` option when you start the debugger.

You can customize your debugger environment source code search paths by adding commands to your `.idbrc` file that use the `use` command.

Example

```
(idb) use
Directory search path for source files:
. ../src /home/user/examples
(idb) use aa
Directory search path for source files:
. ../src /home/user/examples aa
(idb) use bb cc
Directory search path for source files:
. ../src /home/user/examples aa bb cc
(idb) use bb
Directory search path for source files:
. ../src /home/user/examples aa bb cc
```

```
(idb) use aa bb cc
Directory search path for source files:
. ../src /home/user/examples aa bb cc
(idb) set $dbxuse = 1
(idb) use aa
Directory search path for source files:
. ../src /home/user/examples aa
```

See Also

show source directory (idb mode only)
unuse (idb mode only)
"$dbxuse" in Chapter 8

watch (gdb mode only)

Set a write watchpoint on the specified expression.

Syntax

```
watch lvalue
```

Parameters

lvalue	An expression that designates a memory location.

Description

This command sets a write watchpoint on the specified expression. When the debuggee writes to the memory location designated by *lvalue*, it stops.

The debugger does not detect writing if the value of memory is not changed.

Watchpoints are also referred to as *data breakpoints*.

See Also

awatch (gdb mode only)
rwatch (gdb mode only)
watch (idb mode only)

watch (idb mode only)

Set a watchpoint on the specified variable or memory range.

Syntax

```
watch memory start-addr [, end-addr| :size] [access] [thread id {,...}]
[within funcname] [if cond] [commands]
```

```
watch variable lvalue [access] [thread id {,...}] [within funcname] [if
cond] [commands]
```

Parameters

lvalue	An expression that designates a memory location.
id	A thread ID.
cond	A conditional expression.
commands	A list of debugger commands.
start-addr	The address at the start of the memory region.
end-addr	The address at the end of the memory region starting from *start-addr*.
size	The size of the memory region starting from *start-addr*.
funcname	The name of a function.
access	Possible values are: • `write` • `read` • `changed` This mode detects writes that change the contents of the memory. • `any` This mode detects both `read` and `write`. Default value: `write`

Description

This command sets a write watchpoint on the specified variable or memory range. Watchpoints are also referred to as *data breakpoints*.

If *varname* is a pointer, `watch variable` *varname* watches the content of the pointer, not the memory that *varname* points to. Use `watch memory` **varname* to watch the memory pointed to by *varname*.

You can use watchpoints to determine when a variable or memory location is read from, written to, or changed.

You can specify a variable whose memory is to be watched, or specify the memory directly. You can set the accesses that the debugger watches to those that:

- write (the default)
- read
- write and actually change the value
- all accesses

If you specify a variable, the memory to be watched includes all of the memory for that variable, as determined by the variable's type.

If you specify memory directly in terms of its address, the memory to be watched is defined as follows:

- *start-addr* is the address at the beginning of a memory region. This memory region is 8-bytes in size when you do not specify *end-addr* or *size*.
- If you specify *size*, the memory region starts with *start-addr* and is *size*-bytes long.
- If you specify *end-addr*, the memory region is from *start-addr* through *end-addr*, inclusive.

To set a watchpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a watchpoint based on a conditional expression, specify `if` *cond*.

To run one or more commands upon hitting a watchpoint, specify *commands*.

If you specify `within` *funcname*, program execution breaks only when the access occurs in the specified function.

Example

The following example watches for write accesses to the variable *_nextNode*:

```
(idb) whatis _nextNode
class Node* Node::_nextNode
(idb) print "sizeof(_nextNode) =", sizeof((_nextNode))
sizeof(_nextNode) = 4
(idb) watch variable _nextNode write
[#3: watch variable _nextNode write]
```

The following example watches the 4 bytes specified on the command line.

```
(idb) watch memory &_nextNode, ((long)&_nextNode) + 3 read
[#5: watch memory &_nextNode, ((long)&_nextNode) + 3 read]
```

The following example watches the 2 bytes specified on the command line for a change in contents.

```
(idb) stop memory &_nextNode : 2 changed [#6: stop memory &_nextNode : 2 changed]
```

If you specify the `within` modifier, then the debugger watches only those accesses that occur within the specified function, but not any function it calls. For example:

```
(idb) whatis t
int t
(idb) stop variable t write within C::foo(void)
[#3: stop variable t write within void C::foo(void)]
(idb) cont
Select from
-----------------------------------------------------
1 int C::foo(double*)
2 void C::foo(float)
3 void C::foo(int)
4 void C::foo(void)
5 None of the above
-----------------------------------------------------
5
Value of <overloaded function> not completely specified
foo is not a valid breakpoint address
[3] Address 0x0804d5d0 was accessed at:
void C::foo(void): src/x_overload.cxx
[line 22, 0x08048789] foo+0x3: movl $0x0, 0x804d5d0
0x0804d5d0: Old value = 0x0000000f
0x0804d5d0: New value = 0x00000000
[3] stopped at [void C::foo(void):22 0x08048793]
22 void C::foo() { t = 0; state++; return; }
```

whatis

Print the type of a variable.

Syntax

```
whatis expr
```

Parameters

expr	The expression whose type you want to print. The expression can be a normal language expression or the name of a type, function, or other language entity.

Description

This command prints the type of a variable.

You can print information about the basic nature of an expression. The debugger shows you information about the entity rather than evaluating it. However, it will evaluate any contained expressions, such as pointers, needed to determine the entity to which you are referring.

Example

The following example uses the `whatis` command to determine the storage representation for the data member `_classification`:

```
(idb) whatis sun->_classification
const enum StellarClass Star::_classification
(idb) whatis StellarClass
enum StellarClass {O, B, A, F, G, K, M, R, N, S}
(idb) print sun->_classification
G
```

when (idb mode only)

Set a breakpoint that executes a command list when it is hit.

Syntax

`when [quiet] detector [thread ID,…] [if cond] [commands]`

Parameters

See the `stop` commands.

Description

This command sets a breakpoint that executes a list of commands when it is hit and both `thread` and `if` conditions, if specified, evaluate to `TRUE`.

When the event specified by the breakpoint occurs and all processing for that breakpoint has been completed, the debugger resumes execution of the program.

`detector` represents the various syntactical variations of the `stop` commands, such as *`in`*, *`at`*, and *`variable`*.

The difference between `stop` and `when` is that a breakpoint created using `stop` suspends the execution when hit, whereas one created using `when` does not.

See Also

`stop in (idb mode only)`
`stop at (idb mode only)`
`stop pc (idb mode only)`
`stop variable (idb mode only)`
`stop memory (idb mode only)`
`stop signal (idb mode only)`
`stop unaligned (idb mode only)`
`stop every (idb mode only)`

wheni (idb mode only)

Set an instruction breakpoint that executes a command list when it is hit.

Syntax

```
wheni [traced_expression] [thread id ,...] [at address] [if cond]
{commands ;...}
wheni address [thread id ,...] [if cond] {commands ;...}
```

Parameters

commands	A list of debugger commands.

For all other parameters, see the `stopi` command.

Description

This command sets an instruction breakpoint that executes a command list when it is hit.

The difference between `stopi` and `wheni` is that a breakpoint created using `stopi` suspends the execution when hit and does not execute any commands, whereas one created using `wheni` does not suspend execution and does execute commands.

See Also

stopi (idb mode only)

where (idb mode only)

Show the current stack trace of currently active functions.

Syntax

```
where [num] [thread { thread_id, ... | all | * } ]
```

Parameters

num	The number of call frames to show, starting from the beginning of the stack.
thread_id	The thread whose call stack should be shown.
`all	*`	Display the full stack trace of all threads. `all` and `*` are equivalent.

Description

This command displays the stack trace of currently active functions.

If you do not specify the `thread` keyword, the debugger displays the stack trace of currently active functions for the current thread.

If you specify the `thread` keyword, the debugger displays the stack trace of the specified threads.

To display a specific number of call frames at the top of the stack, specify the *num* parameter. Each active function is designated by a number, which you can use as an parameter for the `func` command. If you do not specify the number, the debugger displays all levels.

The top level on the stack is 0.

For example, if you enter the command `where 3`, the debugger displays levels 0, 1, and 2.

When large and complex values are passed by value to a routine on the stack, the output of the `where` command can be voluminous. You can set the control variable *$stackargs* to 0 to suppress the output of argument values in the call stack. Setting `$stack_levels` to a numeric value limits the number of stacks displayed to the specified value.

See Also

backtrace (gdb mode only)
show thread (idb mode only)

whereis (idb mode only)

Show all declarations of a specific expression.

Syntax

`whereis` *name*

Parameters

name	An identifier or typedef name of the expression.

Description

The `whereis` command lists all declarations of a variable and each declaration's fully qualified scope information.

The scope information of a variable usually consists of the name of the source file that contains the function in which the variable is declared, the name of that function, and the name of the variable. The components of the scope information are separated by back-quotes (`).

You can use this command to obtain information needed to differentiate overloaded identifiers that are in different units, or within different routines in the same unit.

The following example shows how to set breakpoints in two C++ methods, both named `print`:

```
(idb) whereis printBody
"/home/user/examples/solarSystemSrc/heavenlyBody.cxx"`HeavenlyBody::
printBody(const class HeavenlyBody*, unsigned int)
"/home/user/examples/solarSystemSrc/planet.cxx"`Moon::printBody(unsi
gned int) const
"/home/user/examples/solarSystemSrc/planet.cxx"`Moon::printBody(unsi
gned int) const
"/home/user/examples/solarSystemSrc/planet.cxx"`Planet::printBody(un
signed int) const
"/home/user/examples/solarSystemSrc/planet.cxx"`Planet::printBody(un
signed int) const
"/home/user/examples/solarSystemSrc/star.cxx"`Star::printBody(unsign
ed int) const
"/home/user/examples/solarSystemSrc/star.cxx"`Star::printBody(unsign
ed int) const
(idb) stop in "star.h"`Star::printBody
```

```
Select from
-----------------------------------------------------
1 /home/user/examples/solarSystemSrc/main/solarSystem.cxx
2 /home/user/examples/solarSystemSrc/star.cxx
3 None of the above
-----------------------------------------------------
1
[#2: stop in virtual void Star::printBody(unsigned int) const]
```

See also the `which` command for another example of the `whereis` command.

If you are not sure how to spell a symbol, you can use the `whereis` command to search the symbol table for the regular expression represented by the quoted string. All symbols that match the rules of the regular expression are displayed in ascending order. For example:

```
(idb) whereis planet
Symbol not found
(idb) whereis "[Pp]lanet"
"solarSystemSrc/derived_class_includes/planet.h"`Moon::Moon(char*,
Megameters, Kilometers, class Planet*)
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet::Planet(char
*, Megameters, class HeavenlyBody*)
"solarSystemSrc/derived_class_includes/planet.h"`Planet::Planet(char
*, Megameters, class HeavenlyBody*)
"solarSystemSrc/derived_class_includes/planet.h"`Planet::print(unsig
ned int)
"solarSystemSrc/derived_class_includes/planet.h"`__INTER__Moon_Moon_
Orbit_Planet_Xv
"solarSystemSrc/derived_class_includes/planet.h"`__INTER__Planet_Pla
net_Orbit_Xv
"solarSystemSrc/derived_class_includes/planet.h"`__dt__6PlanetXv
__T_6Planet
__cxxexsig6Planet
__vtbl_5Orbit6Planet
```

```
__vtbl_5Orbit6Planet4Moon
__vtbl_6Planet
solarSystemSrc/derived_class_includes/planet.h
solarSystemSrc/derived_class_includes/planet.h
solarSystemSrc/derived_class_includes/planet.h
solarSystemSrc/planet.cxx
(idb) whereis "^Planet$"
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet::Planet(char
*, Megameters, class HeavenlyBody*)
(idb) whereis Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet::Planet(char
*, Megameters, class HeavenlyBody*)
(idb) which Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
(idb) whatis Planet
class Planet : HeavenlyBody, Orbit {
Planet(char*, Megameters, class HeavenlyBody*);
virtual void print(unsigned int);
}
```

You can use the *$symbolsearchlimit* debugger variable to specify the maximum number of symbols that will be returned by the `whereis` command for a regular expression search. The default value for the *$symbolsearchlimit* variable is 100; a value of 0 indicates no limit.

See Also

which (idb mode only)

which (idb mode only)

Show the full scope of an expression.

Syntax

```
which name
```

Parameters

name	An identifier or typedef name of the expression.

Description

This command shows the full scope of an expression.

Use this command to determine to which declaration an identifier resolves. This command shows the fully qualified scope information for the instance of the specified expression visible from the current scope.

The scope information of a variable usually consists of the name of the source file that contains the function in which the variable is declared, the name of that function, and the name of the variable. The components of the scope information are separated by back-quotes (`).

Example

The following example shows how to use the `whereis` and `which` commands to determine a variable's scope:

```
(idb) where 4
>0 0x08053549 in ((Planet*)0x806ae98)->Planet::printBody(i=2)
"/home/user/examples/solarSystemSrc/planet.cxx":19
#1 0x0804bacf in
((HeavenlyBody*)0x806ae98)->HeavenlyBody::printBodyAndItsSatellites(i=2)
"/home/user/examples/solarSystemSrc/heavenlyBody.cxx":62
#2 0x0804bb0a in
((HeavenlyBody*)0x806ae40)->HeavenlyBody::printBodyAndItsSatellites(i=1)
"/home/user/examples/solarSystemSrc/heavenlyBody.cxx":68
#3 0x08056745 in main()
"/home/user/examples/solarSystemSrc/main/solarSystem.cxx":120
(idb) which i
"/home/user/examples/solarSystemSrc/planet.cxx"`Planet::printBody(unsign
ed int) const`i
```

```
(idb) assign i = 10
(idb) print i
10
(idb) whereis i
"/home/user/examples/solarSystemSrc/heavenlyBody.cxx"`HeavenlyBody::prin
tBodyAndItsSatellites(unsigned int) const`i
"/home/user/examples/solarSystemSrc/heavenlyBody.cxx"`HeavenlyBody::prin
tBodyAndItsSatellites(unsigned int) const`i
"/home/user/examples/solarSystemSrc/heavenlyBody.cxx"`HeavenlyBody::sate
lliteNumber(class HeavenlyBody*) const`i
"/home/user/examples/solarSystemSrc/main/solarSystem.cxx"`main`i
"/home/user/examples/solarSystemSrc/main/solarSystem.cxx"`printBiggestMo
ons`i
"/home/user/examples/solarSystemSrc/main/solarSystem.cxx"`trackBiggestMo
ons(class Moon*)`i
"/home/user/examples/solarSystemSrc/planet.cxx"`Moon::printBody(unsigned
int) const`i
"/home/user/examples/solarSystemSrc/planet.cxx"`Planet::printBody(unsign
ed int) const`i
"/home/user/examples/solarSystemSrc/star.cxx"`Star::printBody(unsigned
int) const`i
(idb) func HeavenlyBody::printBodyAndItsSatellites
void HeavenlyBody::printBodyAndItsSatellites(unsigned int) const in
/home/user/examples/solarSystemSrc/heavenlyBody.cxx line No. 62:
62 printBody(i); {static int somethingToReturnTo; somethingToReturnTo++;
}
(idb) which i
"/home/user/examples/solarSystemSrc/heavenlyBody.cxx"`HeavenlyBody::prin
tBodyAndItsSatellites(unsigned int) const`i
(idb) print i
2
```

while

Execute the command list while the specified expression is not zero.

Syntax

GDB Mode:

```
while expr
commands
end
```

IDB Mode:

```
while expr "{" commands "}"
```

Parameters

expr	Conditional expression controlling the while-loop
commands	One or more debugger commands or programmatic expressions to be executed. **GDB Mode:** Enter one command per line. **IDB Mode:** Delineate commands with a semicolon (;).

Description

The debugger executes the commands in *cmdlist* as long as *expr* evaluates to a non-zero value.

This is different from testing for true or false according to the current language. For example, if the current langauge is Fortran and the expression evaluates to 2, the `while` continues, because although 2 is `.FALSE.` in Fortran, 2 is non-zero.

While you can put `continue`, `step` or `next` commands in the `while` command's body, be aware that doing so may lead to confusion. For example, breakpoints may trigger during a continuation of the application within the body of the the `while` command.

GDB Mode: This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the **Console** window in the GUI.

Example

GDB Mode:

```
(idb) set $loop = 5
```

```
(idb) while $loop > 0
 >output "$loop is "
 >output $loop
 >echo \n
 >set $loop = $loop - 1
 >end
$loop is 5
$loop is 4
$loop is 3
$loop is 2
$loop is 1
```

IDB Mode:

```
(idb) while $loop > 0 { p $loop; set $loop = $loop - 1}
5
4
3
2
1
(idb)
```

The following example demonstrates a more complicated use of the `while` command, including continuing the application within the body of the `while`:

IDB Mode:

```
(idb) run
The list is:
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
(idb)
(idb) while (currentNode->_data != 5) { print "currentNode->_data is ",
currentNode->_data; cont }
currentNode->_data is 1
Node 1 type is integer, value is 1
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
```

```
currentNode->_data is 2
Node 2 type is compound, value is 12.345
parent type is integer, value is 2
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
currentNode->_data is 7
Node 3 type is compound, value is 3.1415
parent type is integer, value is 7
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
currentNode->_data is 3
Node 4 type is integer, value is 3
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
currentNode->_data is 4
Node 5 type is integer, value is 4
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
(idb)
(idb) print currentNode->_data
5
```

x (gdb mode only)

Print memory at the specified address.

Syntax

```
x [/nfu] [addr]
```

Parameters

n
The amount of memory to display, in units set by *u*.
The default value is 1

f
The format in which to display memory. Possible values are:
- i instr
- s string
- x hex
- d sdecimal
- u udecimal
- o octal
- t binary
- a addr
- c char
- f float

The default changes each time you use this command or the print command. The initial default value is x.

u
The units in which to display memory. Possible values are:
- b byte
- h halfword
- w word
- g giant (8 bytes)

The default changes each time you use this command.

addr
The starting address for which you want to print memory. The default is the address following the most recently printed address when using this or the print command.

Description

This command prints memory.

When you use defaults for *n*, *f*, and *u*, the slash (/) is optional.

Example

```
(idb) x/10i &main
0x080483c4 <main>:      pushl   %ebp
0x080483c5 <main+1>:    movlr   %esp, %ebp
0x080483c7 <main+3>:    subl    $0x3, %esp
0x080483ca <main+6>:    andl    $-8, %esp
0x080483cd <main+9>:    addl    $0x4, %esp
0x080483d0 <main+12>:   subl    $0x14, %esp
0x080483d3 <main+15>:   flds    0x8048628
0x080483d9 <main+21>:   fstps   -20(%ebp)
0x080483dc <main+24>:   movl    $-1, -16(%ebp)
0x080483e3 <main+31>:   movl    $0xa, -12(%ebp)
End of assembler dump.
```

See Also

print

List of Predefined Debugger Variables

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The debugger has the following predefined variables. Conventionally, an Intel® Debugger variable name is an identifier with a leading dollar sign (`$`).

Table 8-1 List of Debugger Variables

Variable	Default	Setting Description
`$aggregatedmsghistory`	0	Controls the length of the aggregated message list. If set to the default (0), the debugger records as many messages as the system will allow.
`$ascii`	1	Displays whether prints ASCII or all ISO Latin-1. See `$lc_ctype`.
`$beep`	1	Beeps on illegal command line editing.
`$childprocess`	0	When the debugger detects a fork, it assigns the child process ID to `$childprocess`.
`$curcolumn`	0	Displays the current column number if that information is available; 0 otherwise.
`$curevent`	0	Displays the current breakpoint number.
`$curfile`	(null)	Displays the current source file name.

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Variable	Default	Setting Description
`$curfilepath`	(null)	Displays the current source file access path.
`$curline`	0	Displays the current source line.
`$curpc`	0	Displays the current point of program execution.
`$curprocess`	0	Displays the current process ID.
`$cursrcline`	0	Displays the last source line at end of most recent source listing.
`$cursrcpc`	0	Displays the PC address at end of most recent machine code listing.
`$curthread`	0	Displays the current thread ID.
`$dbxoutputformat`	0	Displays various data structures in dbx format.
`$dbxuse`	0	Replaces (0) or appends to (1) current use paths
`$decints`	0	Displays integers in decimal radix.
`$doverbosehelp`	1	Displays the help menu front page.
`$editline`	1	Enables or disables Emacs*-like control characters in the debugger. It is not possible to use vi*-like commands in IDB. In the GUI console mode, this functionality is disabled by default. In the command-line interface, it is enabled by default.
`$eventecho`	1	Echoes events with event numbers.

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Variable	Default	Setting Description
`$exitonterminationofprocesswithpid`	None	If set to process ID (pid), when that process terminates, the debugger exits.
`$float80bit`	1	If set to 0 (the default), prints 128-bit floating point numbers normally;if set to a non-zero value, prints 128-bit floating point numbers as 128-bit containsers holding 80-bit floating point numbers.
`$floatshrinking`	1	If set to the default (1), the debugger prints binary floating point numbers using the shortest possible decimal number. If set to 0, the debugger prints the decimal number which is the closest representation in the number of decimal digits available of the internal binary number.
`$framesearchlimit`	0	Defines the maximum number of call frames by which to extend normal language-based identifier lookup.
`$funcsig`	1	Displays function signature at breakpoint.
`$gdb_compatible_output`	0	Makes IDB output compatible with GDB output.
`$givedebughints`	1	Displays hints on debugger features.
`$hasmeta`	0	Interprets multibyte characters.
`$hexints`	0	Displays integers in hex radix.
`$highpc`	(internal debugger variable)	Returns the highest address associated with "function".
`$historylines`	20	Defines the number of commands to show for `history`.

Table 8-1 List of Debugger Variables

Variable	Default	Setting Description
`$indent`	1	Prints structures with indentation.
`$lang`	"None"	Defines the programming language of current routine.
`$lasteventmade`	0	Displays the number of last (successful) breakpoint definition.
`$lc_ctype`	result of setlocale (`LC_CTYPE,0L`)	Defines the current locale information. If set, passes the value through `setlocale()` and becomes the result. "" is passed as `0L`.
`$listwindow`	20	Displays the number of lines to show for `list`.
`$main`	"main"	Displays the name of the first routine in the program.
`$maxstrlen`	128	Defines the length of the largest string (in characters) to printed in full.
`$memorymatchall`	0	When set to non-zero, displays all memory matches in the specified range. Otherwise, only the first memory match is displayed.
`$octints`	0	Displays integers in octal radix.
`$overloadmenu`	1	Prompts for choice of overloaded C++ name.
`$page`	1	If non-zero, debugger terminal output is paged.
`$pagewindow`	0	Defines the number of lines per output page. The default of 0 causes the debugger to query the terminal for the page size.

Table 8-1 List of Debugger Variables

Variable	Default	Setting Description
`$parallel_branchingfactor`	8	Specifies the factor used to build the `n`-nary tree and determine the number of aggregators in the tree.
`$parallel_aggregatordelay`	3000 milliseconds	Specifies the length of time that aggregators wait before they aggregate and send messages down to the next level when not all the expected messages have been received.
`$parentprocess`	0	When the debugger detects a fork, it assigns the parent process ID to `$parentprocess`.
`$pimode`	0	Echoes input to log file on `playback` input. Only applicable to IDB mode.
`$prompt`	`"(idb) "`	Specifies debugger prompt.
`$readtextfile`	0	If set to non-zero, instructions are read from the text area of the binary file rather than from the memory image.
`$regstyle`	1	Controls the format of register names during disassembly. Valid settings are: 0 = compiler names, for example, `t0`, `ra`, or zero. 1 = hardware names, for example, r1, r26, or r31. 2 = assembly names, for example, `$1`, `$26`, or `$31`.
`$repeatmode`	1	Repeats previous command when you press Enter if `1`.
`$reportsotrans`	0	Report when an event was changed because a shared object library was either opened or closed if `1`.

Table 8-1 List of Debugger Variables

Variable	Default	Setting Description
$showlineonstartup	0	Displays the first executable line in `main` if `1`.
$showwelcomemsg	1	Displays welcome message at startup time if `1`.
$stackargs	1	Shows arguments in the call stack if `1`.
$stack_levels	50	Controls the number of call stack output levels.
$statusargs	1	Prints breakpoints with parameters if `1`.
$stepg0	0	Steps over routines with minimal symbols if `1`.
$stoponattach	0	Stops the running process on `attach` if `1`.
$symbolsearchlimit	100	Specifies the maximum number of symbols that will be returned by the `whereis` command for a regular expression search. The default value is 100; a value of 0 indicates no limit.
$threadlevel	native	Specifies native threads.
$usedynamictypes	1	Evaluates using C++ static (if 0) or dynamic (if `1`) type.
$verbose	0	Produces even more output if `1`.
$catchexecs	0	Stops execution on program exec.
$catchforkinfork	0	Notifies you as soon as the forked process is created (otherwise you are notified when the call finishes).
$catchforks	0	Notifies you on program fork and stops child.